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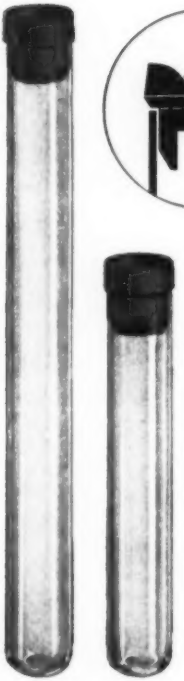

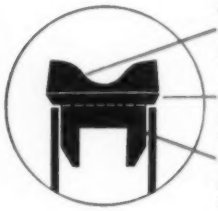

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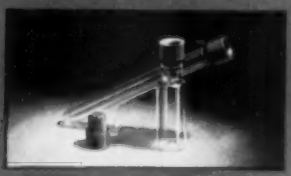

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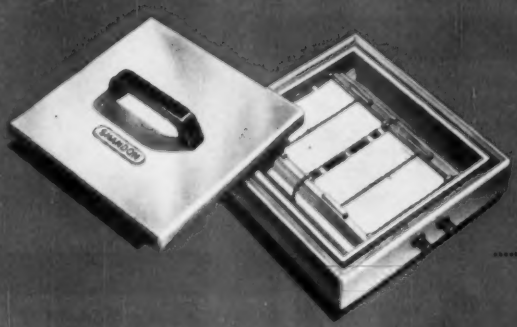

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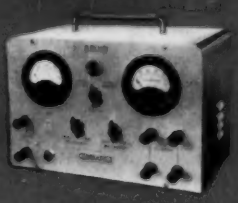

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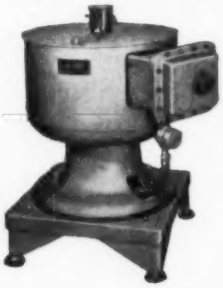

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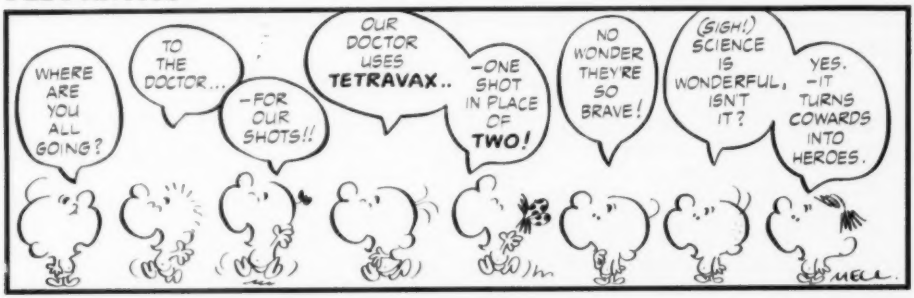
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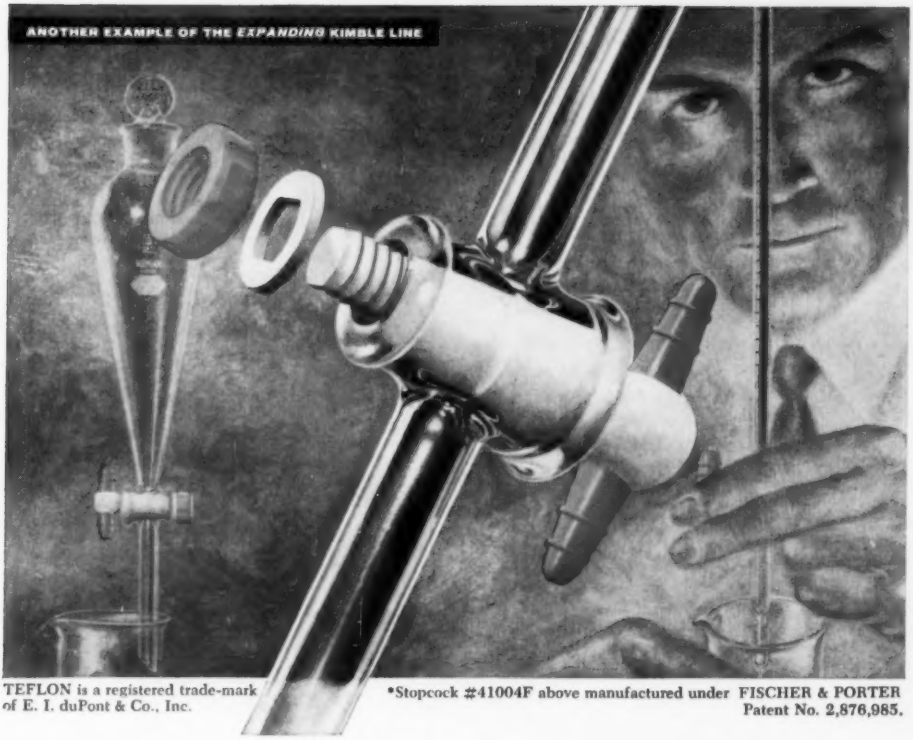

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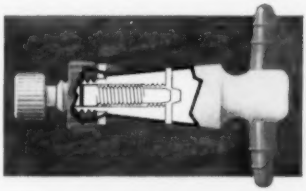

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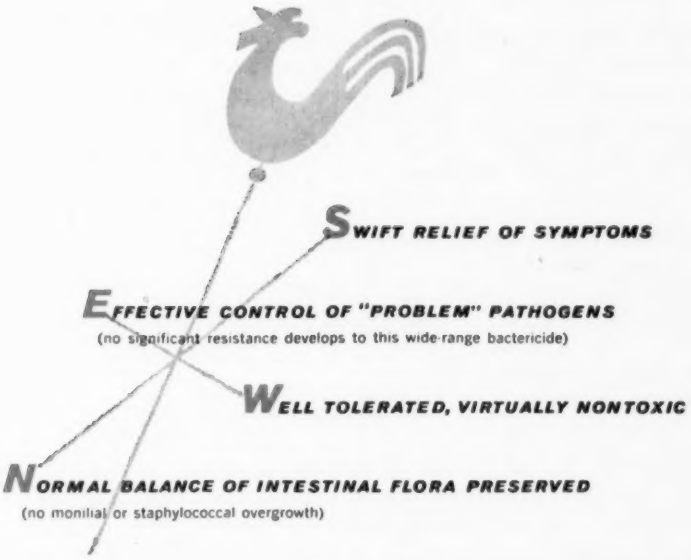
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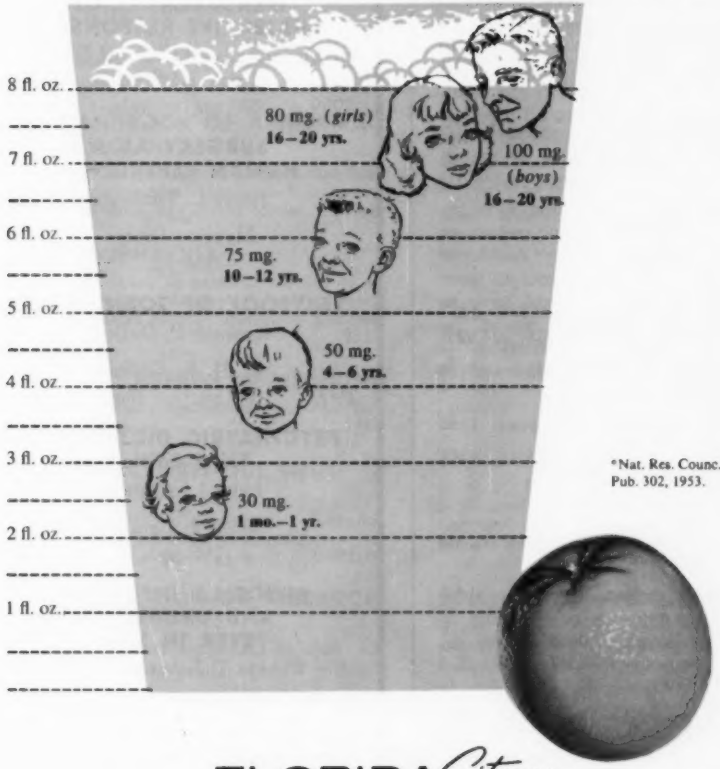

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Journal of Public Health

This year the Annual Bookshelf looks both backward and forward. This wide view will, we hope, enable public health workers and all others concerned with the health of the community to see themselves in this larger perspective.

A BOOKSHELF ON THE HISTORY AND PHILOSOPHY OF PUBLIC HEALTH

John J. Hanlon, M.D., M.P.H., F.A.P.H.A.; Fred B. Rogers, M.D., M.P.H., F.A.P.H.A.; and George Rosen, M.D., M.P.H., F.A.P.H.A.

"IT IS IMPORTANT that a public health officer should be more than a technician. He needs a philosophy to guide his actions. He is responsible for the welfare of large groups and needs a never-ending enthusiasm to carry out his task . . . . Every situation we find ourselves in is always the result of definite historical developments and trends. If you know them, if you are aware of them, you are bound to act more intelligently."

(Henry E. Sigerist. Preface to Landmarks in the History of Hygiene. Oxford University Press, 1956.)

A professional worker of any depth or breadth wants to know more than just the agenda for today. He is sensitive to that third dimension which only historical perspective can give. He is proud of his profession, and part of that pride stems from a tradition of service. Tradition, moreover, is the life-line of a culture and a fundamental element of its history. A blend of history and philosophy fused coherently with present-day perspectives yields a creed or point of view, to clarify and dignify current efforts. The evolution of our concepts and practices in public health—man's humanity to man— from primitive origins to present-day science, provides a vital chapter of the history of mankind. One encounters considerable difficulty in attempting to distinguish sharply between history and philosophy. What has already transpired (history) was shaped by the attitudes, ideals, and vision (philosophy) of the

past. Similarly, our generation is now creating the future. Thus philosophy and history merge, one into the other. Nonetheless, we have endeavored to make some distinction, even though we recognize it as somewhat artificial.

The following publications, listed chronologically and by topic, provide a guide to significant, accessible literature on the history and philosophy of the art and science of public health and on some of the fields most intimately related to it. Most conspicuous of the latter are medicine, and especially preventive medicine. To a considerable extent these may still be considered the basic and most potent sources for a society's efforts to improve and to maintain its health. Included also are a number of pertinent references from the social sciences.

To avoid undue duplication, much material previously published in bookshelf articles in this Journal has not been repeated here. Relevant previous bookshelves included historical and philosophical references; the interested reader is therefore directed to these compilations:

Williams, Huntington. The Health Officer's Bookshelf. A.J.P.H. 38:467 (Apr.), 1948.

Rosen, George. The Health Educator's Bookshelf. Ibid. 39:433 (Apr.), 1949.

James, George; Greenberg, Morris; and Getting, Vlado A. The Medical Officer's Bookshelf on Epidemiology and Evaluation. Ibid. 47:401 (Apr.), 1957.

Hanlon, John J. A Bookshelf on International Health. Ibid. 48:413 (Apr.), 1958.

Rosen, George, and Wellin, Edward. A Bookshelf on the Social Sciences and Public Health. Ibid. 49:441 (Apr.), 1959.

While the above quotation from Sigerist and various references that follow specifically mention the health officer and the physician, the thought and content are in large part equally applicable to all individuals and disciplines that strive for the improvement of the public health.

I. Public Health: Past and Present

A. General History

The history of public health is the story of man's endeavors to protect himself and his fellows against the hazards to health entailed by group life. Today, one of the most important functions of the modern state is considered to be the protection and promotion of the health and welfare of its citizens. This function is embodied in public policy and involves political, economic, social, and ethical considerations. Not only is the state concerned with the health of its own members, but almost as much with the problems of other peoples. Today public health is international. But whence this concern for the health of the group, and how did we arrive at the stage of development at which we find ourselves? For answers to these questions we must turn to the history of the community and its health problems.

History illuminates the public concern with health. Out of the need for dealing with the health problems of group living, there has evolved with increasing clarity a recognition of the signal importance of community action in the promotion of health and the prevention and treatment of disease. This recognition is summed up in the concept of public health. It has its roots in such rudimentary measures as the rituals and incantations against pestilence of ancient Mesopotamia, in the advanced administrative systems of Imperial Rome, in the ruthless isolation of the person afflicted with leprosy or plague in the medieval city, in the needs of kings and princes to achieve and maintain power through large populations, and in the continuing search and devotion of numberless men and women who have desired only to better the condition of their fellows. These roots have given rise to many stems and are con-

tinuing to add new ones to the mighty trunk that is public health.

To trace this process, however, is not an end in itself. Ultimately, the value of this act resides in the light thrown upon the formation of policy and the application of knowledge. Public health is an intimate and intricate part of the social organism. It must deal with problems created by political or economic action, but in turn the consequences of its own development may raise political and social issues. For this reason, the character of community health action, dynamic and changing, requires us to be aware of the significant trends and issues. In this sense, we offer the past as prologue to the present and the future.

This section offers a number of books and one periodical which in varying degree provide comprehensive historical treatments of public health. History is an ancient, yet ever varying discipline. Historians have written in a variety of genres, and their work differs as the life and spirit of different ages vary. That is why at various times and in different countries men have approached the historical task in diverse ways. Indeed, even in a given period, different, often opposed histories are written. While the works listed below have been written within the past four decades, the reader will find obvious individual differences among their authors. Yet in all of them we will also find the historian's fundamental commitment to truth. Moreover, in all of them the reader will meet men who in diverse ways have been or are active in public health work, and thus in a broad sense meet the qualification implied in Montaigne's dictum that "The only good histories are written by those who had command in the events they describe."

Winslow, C.-E. A. The Evolution and Significance of the Modern Public Health Campaign. New Haven, Conn.: Yale University Press, 1923.

Newman, Sir George. The Rise of Preventive Medicine. London, England: Oxford University Press, 1953.

Ciba Symposia, 11 volumes, 1939-1952.

Brockington, C. F. A Short History of Public Health. London: J. & A. Churchill, 1956.

Sigerist, H. E. Landmarks in the History of Hygiene. London: Oxford University Press, 1956.

Galdston, Iago (Editor). On the Utility of Medical History. New York, N. Y.: International Universities Press, Inc., 1957.

Rosen, G. A History of Public Health. New York: M.D. Publications, Inc., 1958.

B. Disease and Epidemic Disaster

Acute infections, particularly when they occur in epidemic form, have always attracted the attention of the community. One might explain gout as the consequence of high living and faulty diet; but this would not do for epidemics when all kinds of people, men and women, old and young, were attacked by a disease like the plague. In the history of public health, epidemics occupy a prominent place among the situations that precipitated action in the interest of the community's health. Faced with problems of epidemic disease, communities have acted in terms of some prevailing concept of the nature of disease. On the primitive level of knowledge, such action is generally couched in supernatural terms. For thousands of years, epidemics were looked upon as divine judgments on the wickedness of mankind, and it was believed that these punishments were to be avoided by appeasing the wrathful gods. Alongside this theurgical theory of disease, however, there gradually developed the idea that pestilence is due to natural causes involving physical, biological, and social factors, causes that can be studied rationally by the human brain and hand. Beginning with the efforts of the Greeks to create a rational scientific theory of disease causation, men have endeavored to combine observations, experimental facts, speculations, theoretical inferences into theories that

would explain the occurrence of communicable diseases and provide a rationale for their prevention or control. In this sense, the history of disease and the history of epidemiology are basic to an understanding of the development of community action in the interest of health. The works listed below are a representative selection of the literature available in this field. Starting from any point in this list the reader should be able to fan out in several directions on his own initiative.

Hippocrates. "Epidemics I and III," in Hippocrates, with an English Translation by W. H. S. Jones and E. T. Withington. Vol. I. London: W. Heinemann, 1923, pp. 139-287.

Webster, Noah. Brief History of Epidemic and Pestilential Diseases. (2 vols.). Hartford, Conn.: Hudson and Goodwin, 1799.

Haeser, Heinrich. Historisch-Pathologische Untersuchungen. Als Beiträge zur Geschichte der Volkskrankheiten. Dresden and Leipzig, Germany: Gerhard Fleischer, 1839-1841.

Hecker, J. F. K. The Epidemics of the Middle Ages. London: Sydenham Society, 1844.

Drake, Daniel. Principal Diseases of the Interior Valley of North America. Cincinnati, Ohio: Winthrop and B. Smith, 1850.

Haeser, H. Geschichte der epidemischen Krankheiten (2nd ed.). Jena, Germany: H. Dufft, 1865.

Hirsch, A. Handbook of Geographical and Historical Pathology. (3 vols.). London: New Sydenham Society, 1886.

Creighton, Charles. A History of Epidemics in Britain. (2 vols.). Cambridge, Mass.: Cambridge University Press, 1891-1894.

Sticker, Georg. Abhandlungen aus der Seuchengeschichte und Seuchenlehre. (2 vols.). Giessen, Germany: A. Töpelmann, 1908-1912.

Prinzing, F. Epidemics Resulting from Wars. Edited by Harald Westergaard. Oxford, England: Clarendon Press, 1916.

Papers of Charles S. Caverly. Infantile Paralysis in Vermont. Vermont Department of Public Health, Burlington, 1924.

Bell, Walter G. The Great Plague in London in 1665. London: John Lane, 1924.

Budd, William. Typhoid Fever. New York: American Public Health Association, 1931.

Nohl, Johannes. Der Schwarze Tod. Eine Chronik der Pest 1348 bis 1720. Potsdam, Germany: Gustav Kiepenheuer Verlag, 1924.

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C. Public Health Development in Some Countries other than in the United States

Disease may seriously disturb the life of the group. This is particularly true when people fall ill with contagious

diseases, and thus menace the health of their fellow men, or when individuals become a burden on the community because of illness or disability. To deal with such matters society enacts laws and institutes procedures to implement them. Administration even though in a simple form is found early in human history, and from the beginning public health has been primarily a governmental enterprise.

The roots and inspiration of American public health are to be found overseas, chiefly in England. Yet the fact remains that in a number of European countries the administration of public health had much earlier become an increasingly significant part of the general administration of the state. With the growth of the industrial system in the nineteenth century, the older administrative mechanisms proved inadequate and new ones were needed. The rapidly expanding urban environment demanded the measurement of human and natural resources, realistic assessment of the social costs of industrialization, and an effective administrative machinery through which social policy for remedial action could be implemented. This was the public health achievement of the nineteenth and early twentieth centuries.

The lack of adequate administrative histories for various countries is a great gap in the historiography of public health. Nonetheless, significant contributions have been made by a number of authors to limited phases of this subject. Developments in Austria, France, Germany, Great Britain, and Canada are considered in the following references. While there is no single volume that deals comprehensively with the history of public health in Latin America, there is useful information in the work of Aristides A. Moll: Aesculapius in Latin America. Philadelphia, Pa.: Saunders, 1944. Again, the reference to Austria in the list below deals only with the period of enlightened abolutism. Nevertheless, this sampling will enable the reader to understand the influences, factors, and conditions that set the stage on which the founders of American public health played their parts.

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D. Public Health Development in the United States

The general health became a matter of public concern as soon as urban communities arose and grew in the American colonies. In their approach to community health problems, the colonials were imitators, basing their actions on European practices and experience. Furthermore, those in the United States who dealt with community health problems continued to be affected by trends of thought and action in other countries, particularly Great Britain in the nineteenth century. The impact of Edwin Chadwick on John C. Griscom, Lemuel Shattuck, on Stephen Smith can hardly be overlooked. Other influences emanated from France and still later from Germany. To be sure, Americans were working out native problems under indigenous conditions. But the United States was an underdeveloped country, and like underdeveloped lands today looked abroad for ideas and experiences that might be converted to its own needs. Not until the turn of the century does American public health begin to present original and authentic features. Today American public health has important and even basic contributions to its credit. It faces the future aware of problems and difficulties, but also confident that ways and means can be found to solve them. The road that has been traversed from the colonial period to the present is the subject of the following works.

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II. The Philosophy of Public Health

A. Some General Observations

Sextus Julius Frontinus was appointed water commissioner of Rome in 97 A.D. under the Emperor Nerva. He served in this capacity until his death in 103 or 104, and during his tenure he wrote the book on "The Aqueducts of Rome." This work is a primary source of information on the Roman water supply, and the first full account of an important branch of public health administration. But it is much more, for it depicts the motives and ideals, the springs of conduct, the philosophy of a zealous and conscientious public servant who could proudly claim that by his labors he had not only made Rome cleaner and its air purer, but had also removed the causes of disease, which previously had given the city a bad reputation.

Some 1,650 years later a German physician, Johann Peter Frank, recognized that "physicians are rarely in a position to remove such causes of disease as either act on people in the mass or are independent of the will of individuals, no matter how careful they may be. Many of these could be removed through governmental measures." In 1776, he pointed out that the special concern of public health boards is "to eradicate anything that is injurious to the public well-being and to promote anything that tends to preserve and increase the health of the citizens."

In a large sense, the points of view of Frontinus and Frank are just as valid today. The purpose of public health is still the same—to promote health and to prevent or control disease. Not all will agree on the ways and means, nor is the knowledge required always available. Furthermore, no one expects in any forseeable future complete freedom from disease. Health has its biological roots, but the biological processes and phenomena have been and are being influenced, impeded, or facilitated in contexts of changing political, economic, social, and cultural elements. One may almost say that each period of history has its own ideal of health and its own public health. For example, the medieval concept of health was limited by the theological concept of sin. This was particularly true in mental health. Not until the realm of health was extensively secularized was it even possible to begin

to consider mental health in a public health context. In this sense, the concept of public health must of necessity be asymptotic, and this has led some to speak of health as a mirage. The goals of individual and public health are not Platonic ideas, absolute and unchanging. They represent in some form the dominant values of a society, and have usually been justified by other aims: economics, religion, social utility, hedonism. We must develop our philosophy of public health, our aims as individuals, as citizens, as professional people, as members of society. Changing times present new problems, new challenges, and changing concepts of public health.

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B. A Matter of Definition

Many have attempted to define the related concepts of health, public health, and preventive medicine. Some have done so in terms of the functions that are or may be performed. Others have based their statements upon ideals or goals. Specific attention is called to the definitions which appear in the several references below. Those of Winslow and of the World Health Organization have been widely quoted. The very idealistic statement by Rosenau is not known to have been publicly printed elsewhere. Brockington's book is included for its discussions of the meaning of health and public health and of the ecological relationships involved.

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D. Public Health and the Practice of Medicine

As long as medical practitioners dealt with sick people under conditions where the nature of practice seemed to change little, if at all, a separation might be claimed between preventive and curative medicine, the former the province of the health authorities, the latter the sphere of action of the physician. However, as Johann Peter Frank insisted in the eighteenth century, there were situations involving sick people of which government had to take cognizance, and with which individual physicians could not cope. As effective means of prevention were created and were made available to the practitioner, the gap between public health and medicine began to close. Furthermore, shifts in the size and composition of populations, the impact of economic conditions on health problems, the increasing role of complex social mechanisms for the provision of medical care—these and many other aspects of community interdependence are slowly but surely removing the sharp distinctions between preventive and curative medicine. Moreover, the community framework of medical practice is increasingly evident, and public health programs can no longer be carried out in many instances without the cooperation of the medical profession. This transitional situation is reflected in the following publications.

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E. Public Health and Society

Social life involves social control. A social group requires that certain rules of conduct be observed. As groups become larger and life in them more complicated, special arrangements are developed. To deal with the impact of

transmissible disease on the community, to prevent its spread, to see that water and food of good quality and adequate supply are available, to keep the physical environment clean, for these and other purposes, communities have set up public health organizations. Some of the aspects of this relationship between a society and its public health organs are explored below.

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F. Public Health and the State

Because public health is an expression of the aims and values of a society, and is so closely linked with government, the practice of public health has been influenced not alone by the state of scientific knowledge but, equally if not more so, by prevailing theories of society and the state. Johann Peter Frank is inconceivable without mercantilism and absolutism and Edwin Chadwick without philosophic radicalism and classical economics. Similarly, public health in the Soviet Union derives a characteristic stamp from the communist doctrines, just as public health in the United States has been molded by federalism, liberalism, free enterprise, and social reform.

The administration of public health is in part a political art. Any endeavor to understand public health practice must take account of the political dimension, because it lies at the heart of the activity. To quote Plutarch: "They are wrong who think that politics is like

an ocean voyage or a military campaign, something to be done with some particular end in view, something which leaves off as soon as that end is reached. It is not a public chore, to be got over with. It is a way of life."

In line with these thoughts, this section is divided into three parts. The first offers references in the political and administrative context of English public health in the nineteenth century. The second provides materials on American government and administration, as well as on three outstanding practitioners of the political art. Finally, the third section is concerned more directly with public health and government from the enlightened absolutism of the eighteenth century to the welfare state of today.

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G. The Financial Returns of Public Health

Public health activities have been justified or explained on several grounds, such as humanitarianism or scientific interest. A pervading consideration, however, has been economic or social utility. Since population is a factor of production, it is essential to know the number and the "value of people," especially of those occupational groups esteemed most productive. It was the recognition of this need in England in the seventeenth century that led to the first significant attempts to apply statistical methods to the public health. William Petty was one of the first who undertook to calculate the economic loss due to plague.

Another instance is the recognition by Edwin Chadwick that pauperism in numerous instances was the consequence of disease for which the individual could not be held responsible, and that disease was an important factor in increasing the burden of poor relief. He concluded, therefore, that it would be good economy to undertake measures for the prevention of disease. The following references discuss the economic viewpoint and present numerous examples.

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H. Needs in Public Health

Responsibility for protection of community health carries with it an obligation to determine needs. These vary with country, with social and economic group, with climatic conditions, and other factors. In poor and underdeveloped countries health needs may be fundamentally economic. In industrialized countries, other needs prevail. Problems of this type are discussed in the following references.

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I. Education for Public Health

Formal academic training of public health workers is a relatively recent development of the past forty-odd years. The first school was organized in 1912 by William T. Sedgwick at the Massachusetts Institute of Technology. The following year, Sedgwick joined forces with Milton J. Rosenau, professor of preventive medicine at the Harvard Medical School, and George C. Whipple, statistician and sanitary engineer, also of Harvard, to form a school of public health. In 1918, the Johns Hopkins School of Hygiene was opened with William H. Welch as its first director. He had envisioned it as a training facility for public health personnel, and also as contributing to the training of physicians going into medical practice. Later, other schools were created, thus aiding the professionalization of public health. Similar developments have occurred outside the United States. Developments and issues are discussed in the following references.

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J. Research in Public Health

According to Thomas Hobbes, "Desire to know why, and how, curiosity, which is a lust of the mind, that by a perseverance of delight in the continued and indefatigable generation of knowledge, exceedeth the short vehemence of any carnal pleasure." Apparently, more and more public health workers agree with Hobbes, for research on an increasing scale is being undertaken to elucidate problems of community health.

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K. Why Do We Do What We Do?

"To fight out a war," said Justice Holmes, "you must believe something and want something with all your might. So must you do to carry anything else to an end worth reaching. More than that, you must be willing to commit yourself to a course, perhaps a long and hard one, without being able to foresee exactly where you will come out." Is this why public health workers carry on despite frustration and inadequate material rewards? What are the motives of the health officer, the epidemiologist, or of any of the other health workers? Some answer may be obtained from the lives of those who have recorded their thoughts and experiences. A few are listed below.

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L. Public Health and the Future

What of the future? Where is public health going? We must be aware that society is changing, conditions are altering under our eyes. A new public health serving a different society will require new forms of organization and service. Of one thing we may be certain, however, community action for

health will not disappear as long as civilization exists. The focus of public health may alter, the basic tasks will not.

To choose from among the many excellent addresses which have been delivered before the American Public Health Association is a difficult task. Certain of them, however, stand out, especially in relation to this section of the bookshelf.

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Dr. Hanlon is director, Public Health Services, City of Philadelphia, and chairman, Department of Preventive Medicine and Public Health, Temple University School of Medicine; Dr. Rogers is associate professor of preventive medicine and public health, Temple University School of Medicine, Philadelphia, Pa. Dr. Rosen is professor of health education, Columbia University School of Public Health and Administrative Medicine, New York, N. Y., and editor of the American Journal of Public Health.

The following study of milk sampling for the determination of radiation deals with the many considerations that must enter into the selection of surveillance intervals. Relations to the introduction of radioactive debris into the atmosphere are discussed.

SAMPLING INTERVALS FOR SURVEILLANCE OF RADIOACTIVITY IN MILK*

N. Irving Sax; William Haddon, Jr., M.D., M.P.H.; and Otto W. Wendel

PROGRAMS concerned with measuring the radioactive contamination of the environment have been hampered by uncertainty as to proper sampling intervals. Milk, for example, has been sampled at intervals varying from monthly to daily. Recently the Division of Laboratories and Research of the New York State Department of Health carried out daily determinations which have provided an opportunity for assessing the results from various sampling intervals. It is the purpose of this paper: (1) to record and discuss the results of day-to-day analyses of the "beta bone-seeking" group of radioisotopes in milk samples from two dairies in the Capital District of New York State during several months in the spring, summer, and fall of 1959; (2) to compare data from various locations in New York State; (3) to present estimates of the errors which would have resulted from other sampling schedules; and (4) to discuss the implications of these data from the standpoint of the choice of intervals.

The milk samples from Capital District dairies "A" and "B" were obtained from the regular daily deliveries made by these companies one to two days after milking. The samples obtained at intermediate stages of processing from other parts of the state represent shorter intervals following milking. The Capital District comprises Albany, Rensselaer, and Schenectady counties.

Analytical Procedures

Radiochemical Method

The method employed for the determination of the beta bone-seeking radioisotopes, including Sr^{90}, Sr^{89}, and Y^{90} was developed in this laboratory and was reported in detail elsewhere.[1] Briefly, the method consists of oxalate precipitation; ignition of the precipitate to form the corresponding carbonate; placing of the resultant ash in a Saranwrap covered, stainless steel planchet,[2] and counting in a Baird-Atomic low background, anticoincidence Geiger-type beta counter, using an equal weight of KCl as a standard. Although the beta-emitting, bone-seeking group also includes Ca^{45}, Ba^{140}, and La^{140}, it is unlikely that these short half-life isotopes were present in any but negligible amounts in the samples with which this paper is concerned.

* The radioactivity of cow's milk in New York State during spring, summer and fall 1959, considered in the context of the planning of surveillance programs.

Initially, oxalate precipitation was carried out at a pH of 4.5 with 75 per cent recovery of added Sr^{90}-Y^{90}. However, at pH 2.5 to 3.0 a recovery of 94 per cent is obtained, and the latter pH is now employed. The data reported have been adjusted to correspond to 100 per cent recovery.

Reproducibility of Method

Two trials of reproducibility were made during the period from which the data are reported. In each case, five quarts (4.87 kg) of milk as received, were thoroughly mixed and ten 450-gram subsamples taken. These were treated identically and each subsample was counted ten times in each of the four counting channels ordinarily used. In neither experiment did the results from any one channel differ significantly from the mean of the 40 determinations.

The 40 determinations of the first trial yielded a mean of 122.6 $\mu\mu c$/kg, and a standard deviation of 13.08. The resultant 10.7 per cent coefficient of variation may be considered the accuracy of the method and equipment used during the 1959 midsummer peaks.

The second trial, performed in October, 1959, gave a mean of 22.8 $\mu\mu c$/kg and a standard deviation of 6.13. The resultant 26.9 per cent coefficient of variation expresses the accuracy of the method as applied to samples having approximately this radioactivity. Because analytical error decreased with increased activity, the highest activities reported here may be considered to include the smallest errors.

Results

Five-day-per-week sampling of the two dairies began on June 1, 1959. Prior to this, samples had been received less often. The markedly increased radioactivity of the samples collected in late May underscored the need for the more frequent schedule subsequently employed. Figure 1 depicts the results of analyses of milk specimens collected prior to June 1, and Figure 2 the results obtained from specimens collected from June 1 through October 15.

Figure 3 shows the frequency of relative differences of given magnitudes in the day-to-day results from dairies A and B. Similarly, Figures 4, 5, and 6 show the frequencies of given relative differences between individual analytical results and the corresponding three-day, five-day, and three-week means. In a corresponding manner, Figures 7 and 8 compare the Monday-Thursday and Monday-Wednesday-Friday results with the corresponding five-day means.

Discussion

As an introduction to the discussion of the significance and utility of the data presented, Figures 1 and 2 document:

1. The marked elevations in radioactivity in milk from New York State sources which occurred from late May through mid-August, 1959.
2. The continuance, subsequently, of levels markedly higher than those recorded for previous years by other laboratories.
3. The occurrence of very marked day-to-day, week-to-week, and month-to-month variations in the activities of samples from the same sources.
4. The similarity at given times of the activities of samples from widely scattered localities.

These phenomena resulted from the arrival of quantities of radioactive debris at the milk stage of the cow-milkman food chain, and undoubtedly stemmed in large part from the 1958 weapons tests (USA, October, and USSR, October-November). The lag between nuclear detonations with immediately increased fallout and the changes in milk recalls that the growing season in the areas sampled comes to an end in September and early Octo-

ber of each year, and begins once more in the following midspring. Furthermore, although the data deal exclusively with New York State, the knowledge slowly accumulating as to the nature of fallout and scattered reports from other geographical areas, suggests that similar increases occurred, or are still occurring on a world-wide scale. In addition, the similarity of the levels found throughout the large area sampled suggests the relatively uniform fallout over large regions, an important point in the organization of surveillance. Points similar to these might also be made with respect to other species of nuclear debris including, C^{14}, Pu^{239}, I^{131}, Cs^{137}, Zr^{95}, and Nb^{95}.

Despite the many years which have elapsed since the first atom bomb, and despite the biological and historical im-

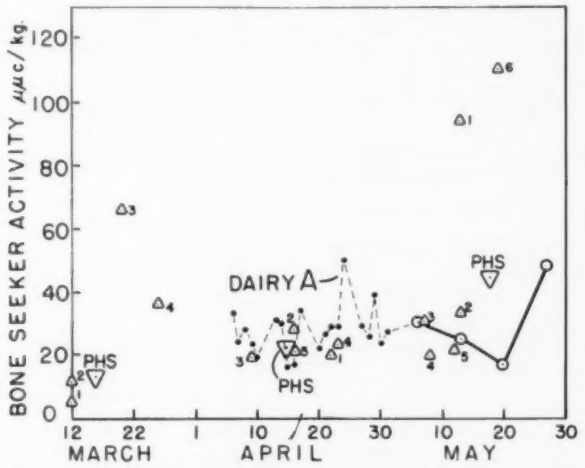

Figure 1—Beta Bone Seeker Activity in Milk Samples from Various Points in New York State, March 12 Through May 30, 1959

– – – – Results of daily samples from dairy A

———— Results of five-day composite samples from Dairy A

Triangle	Other sources. Collection Site	Distance and Direction from Albany Miles	
	1. Riverhead	150	SE
	2. Plattsburgh	167	N
	3. Binghamton	140	SW
	4. Syracuse	135	W
	5. Lockport	257	NW
	6. Garden City	150	SE

PHS Inverted Triangle — USPHS sample. USPHS milkshed, located at Central Bridge, includes about 170 square miles and has approximately 70 herds of cattle contributing to this sample. These data are expressed in $\mu\mu c$ of bone-seeking isotopes per liter of milk, which were estimated by totaling the Sr^{89}, Ba^{140}, and twice the Sr^{90} activity reported.[5]

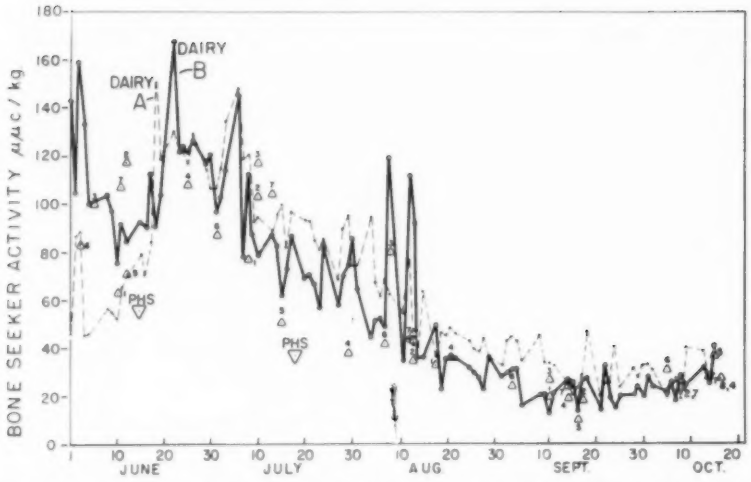

Figure 2—Beta Bone Seeker Activity in Milk Samples from Various Points in New York State, June 1 Through October 16, 1959

– – – – Results of daily samples from dairy A

——— Results of daily samples from dairy B

Triangle	Other sources. Collection Site	Distance and Direction from Albany Miles	
	1. Riverhead	150	SE
	2. Plattsburgh	167	N
	3. Binghamton	140	SW
	4. Syracuse	135	W
	5. Lockport	257	NW
	6. Garden City	150	SE
	7. Central Bridge	30	W
	8. Monroe	125	S

PHS Inverted Triangle — USPHS sample. USPHS milkshed, located at Central Bridge, includes about 170 square miles and has approximately 70 herds of cattle contributing to this sample. These data are expressed in μμc of bone-seeking isotopes per liter of milk, which were estimated by totaling the Sr^{89}, Ba^{140}, and twice the Sr^{90} activity reported.[5]

portance of systematic observations no similar data, derived from daily samples of cow's milk appear to have entered the scientific literature. Indeed, if no further sizable injections of nuclear debris into the atmosphere occur, these data may constitute the only day-to-day record of the resultant changes in milk. If such incidents do occur in the future, these data may make possible added insight into the consequences of such action. These elevations may also constitute the last opportunity for epidemiologists and other research workers to assess the impacts of such relatively transient increases in the degrees of radioactive contamination of man's food and environment. Those

concerned with the biological effects of naturally-occurring radioactivity during the same period should also consider whether or not the radioactivity found in milk was of sufficient magnitude to require consideration relative to that from natural and other sources.

Although this report is concerned neither with the inherent biological hazards of radioactive wastes nor with the appropriateness of the concept of "maximum permissible concentrations" (mpc's), as chosen from time to time, it is pertinent to note that Sr^{90} constituted approximately 15 per cent of the beta bone-seekers present in the milk samples analyzed in April, and from 33 to 40 per cent in those examined in September. In this respect, it is recalled that the mpc of Sr^{90} was fixed in 1959* at 80 $\mu\mu$c/kg.[3]

Several interrelated facts must be considered before any statement relative to the choice of a sampling interval for surveillance purposes can be made. These are:

1. The specific radioisotopes being measured, and their physical, chemical, and biological hazards.

2. The levels of activity considered safe for the most biologically susceptible and heavily exposed portions of the population.

* Arthur S. Flemming, secretary of the Department of Health, Education, and Welfare, announced a change in the mpc for Sr^{90} from 80 to 33 $\mu\mu$c/l. (New York Times, February 26, 1960.)

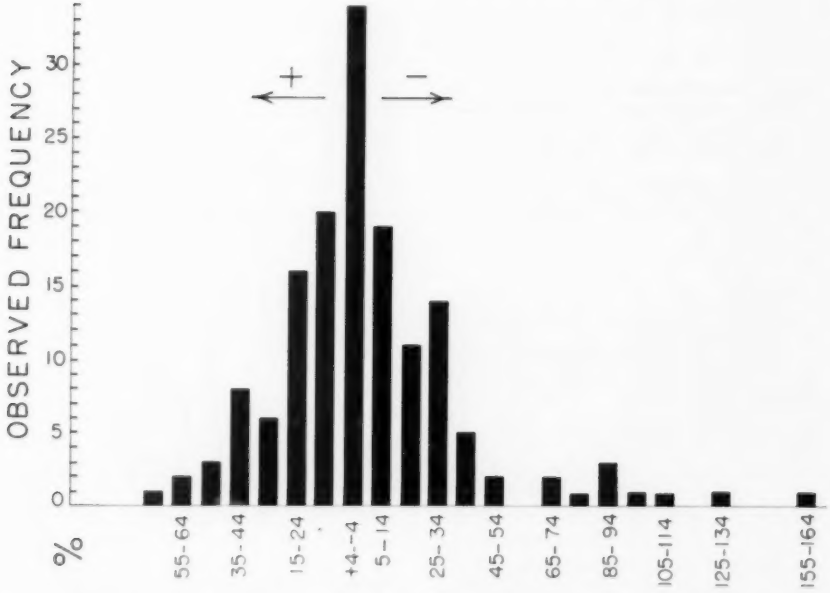

Figure 3—Frequency of Various Relative Differences Between Individual Day's Analytical Results and Those of the Preceding Days

In calculating each relative difference the result for the previous day from the given dairy was subtracted from that of the subsequent day and expressed as a percentage of the latter day's level. Consequently, a positive difference represented an increase in activity.

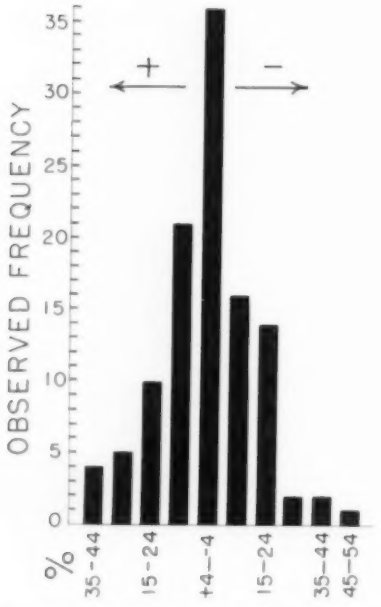

Figure 4—Frequency of Various Relative Differences Between Individual Day's Analytical Results and Those of the Corresponding Three-Day Means

A positive difference represented a result higher than the corresponding mean from the same dairy.

3. The characteristics of the particular vector and its importance.

4. The extent to which the level may change during sampling intervals of various lengths during surveillance.

During late May, June, July, and early August, 1959, concentrations were found which constituted an appreciable fraction of those at present considered hazardous. For a large fraction of the population, particularly children, the vector considered, cow's milk, is the major although not the only source of calcium. Although there is no reason to anticipate precisely similar short- and long-term variations in the future, these data provide the only available data of their type which may be used in the choice of milk surveillance intervals. Because of these considerations, the data have been reported in detail, using an empirical rather than theoretical approach to the variability observed.

Figures 1 through 3 suggest, even when allowance is made for the analytical errors, that sizable day-to-day variations occurred with sufficient frequency to cast doubt on the reasonableness of using the result from an individual day's sample as the basis for an estimate of the results of the following day's determination. Fortunately, in a practical situation where economies in the numbers of specimens from one source which can be processed must be balanced against the resultant loss in the precision with which day-to-day levels are estimated, it is probably of greater importance in all but emergency situations to be able to predict as efficiently as possible the approximate relationships between the results derived from individual specimens and the average radioactivity during periods of several days or longer. Because analytical errors tend to cancel each other when several analytical results are averaged,

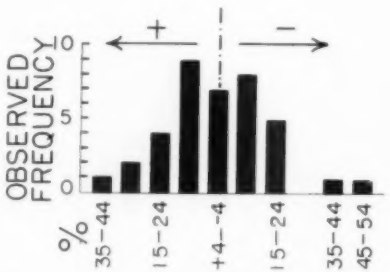

Figure 5—Frequency of Various Relative Differences Between Individual Day's Analytical Results and Those of the Corresponding Five-Day Means

A positive difference represented a result higher than the corresponding mean from the same dairy.

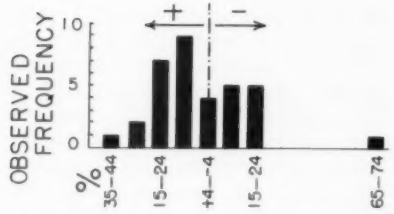

Figure 6—Frequency of Various Relative Differences Between Individual Day's Analytical Results and Those of the Corresponding Three-Week Means

A positive difference represented a result higher than the corresponding mean from the same dairy.

it would be anticipated that the relative differences between individual day's results and the corresponding running means would be smaller than the day-to-day variations in results discussed above, and this is seen in Figures 4 through 8.

Such findings may be used as one basis of the choice of surveillance sampling intervals together with a consideration of the many sources and results of the radioactive contamination of the environment. As noted previously, the latter includes the extent to which the levels in question may change during surveillance intervals, and the risks, vectors, and activities involved. It also includes most careful consideration of the uncertainties inherent in a given situation.

As far as milk is concerned, the first phase of the reported changes appears to have passed, and it might as a result be argued that frequent surveillance is no longer needed. Unfortunately, however, the lack of previous intensive surveillance, the number, size, and variety of past injections of radioactive wastes into the atmosphere, the present uncertainty as to the rates at which fallout occurs, and, in particular, the meager present understanding of the movement of such contamination through human and other food chains, make it imperative that surveillance continue at least until contamination by hazardous isotopes is shown to be no longer increasing. Previous, relatively small, spring increases in the radioactivity of milk, in part attributable to injections during the immediately preceding months, have been recorded.[4] Since fallout continues through the nongrowing months even in the absence of intervening "tests," increases should again occur in the spring of 1960; but these would not be expected to approach in magnitude those seen in June and July, 1959. The base line may increase to some extent, however, as the result of the continued fallout of debris now aloft, but the uncertainties of such predictions underscore the importance of continued, frequent surveillance, at least until the exact situation and its seasonal variation are known.

In general, biologically significant levels of radioactivity, recent increases in such contamination, atmospheric injections during the preceding year, sub-

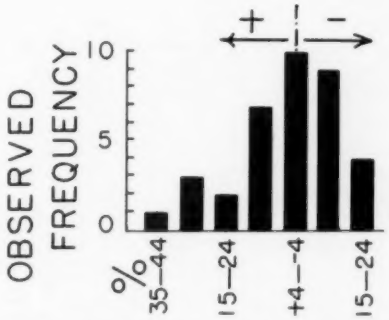

Figure 7—Frequency of Various Relative Differences Between the Means of the Monday-Thursday Analytical Results and Those of the Corresponding Five-Day Means

A positive difference represented a result higher than the corresponding mean from the same dairy.

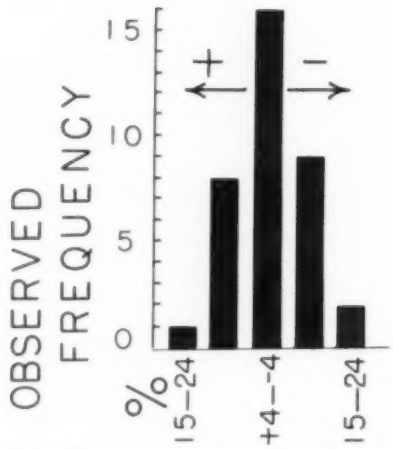

Figure 8—Frequency of Various Relative Differences Between the Means of the Monday-Wednesday-Friday Analytical Results and Those of the Corresponding Five-Day Means

A positive difference represented a result higher than the corresponding mean from the same dairy.

stantial seasonal variations during the same period, changes in the activity of related vectors (air and water in the case of milk, for example) and continuing long-term increases all tend to favor frequent sampling. On a prospective basis, it is essential that surveillance personnel be informed in advance of the approximate dates of all planned surface and atmospheric detonations in order that intensive daily sampling can be conducted until the acute hazard has been assessed. Continuous air monitoring, as carried out by this laboratory since the fall of 1958, serves as a guide, with any marked increase a sign to initiate more intensive sampling.

The marked uniformity in levels found in the milk samples obtained during the same periods from widely scattered milksheds suggests that levels similar to those reported for New York State existed elsewhere, and that regional rather than closely adjacent surveillance sampling points should be established. In addition, it should be clear that whenever appreciable quantities of a given contaminant are demonstrated in an important vector, subsequent surveillance should be based upon the variability demonstrated by sampling of the type reported in this paper. If no further major injections occur, however, opportunities to do this may be rare in the future, with the result that intensive sampling may lead to the underestimation of the variation which might be seen under less stable conditions.

Summary

"Beta bone-seeker" radioactivity in milk samples from the Capital District and other New York State areas began increasing in April and May, 1959. From the 20 to 30 $\mu\mu$c/kg range, the levels mounted until late June when analyses indicated as much as 150 to 167 $\mu\mu$c/kg. The levels gradually declined thereafter, reaching by mid-October those observed during the preceding April. Sr^{90} accounted for 15 per cent of the activities in April, and 33 to 40 per cent of those in September.

It is shown that although the analyses of individual day's samples gave poor estimates of the following day's results, they more satisfactorily approximated the three-day, five-day, and three-week running means.

Activities were found to be similar in samples collected during the same periods from widely scattered New York State points. This suggests that the phenomena observed were very uniform over large areas, and it may not be essential to establish very closely adjacent surveillance points.

The phenomena observed suggest marked increases in the radioactive

debris arriving at the milk stage of the cow-milk-man food chain. These are believed to have resulted in large part from the fall 1958 weapons tests. It is predicted that in the absence of further tests in the interim, increases of smaller magnitude will again be observed in the spring of 1960.

Finally, considerations which must be weighed in selecting surveillance sampling intervals are discussed, and the importance of prior notification of surveillance personnel of the approximate dates of future atmospheric injections of radioactive wastes is emphasized.

The full data upon which this report is based will be supplied by the authors on request.

ACKNOWLEDGMENT — The authors wish to thank John A. Dapolito, Robert T. Drew, and John Del Santo for their technical assistance.

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Mr. Sax is an associate research scientist and head of the radiologic sciences group of the Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.; Dr. Haddon is director of the Driver Research Center of the department; and Mr. Wendel is a senior biophysicist in the radiologic sciences group.

14th Community Nutrition Institute

The College of Home Economics at Syracuse University and the Bureau of Nutrition of the New York State Department of Health are co-sponsoring the 14th Community Nutrition Institute on the Syracuse campus, June 20 to July 1, 1960. Three hours of graduate credit may be earned by registrants.

"No blueprint for public health or community nutrition programs is offered. Rather, the student is provided an opportunity to: take a fresh look at his problems in a new environment and discuss them with fellow participants; (and) discuss the most recent developments in nutrition with outstanding personalities in this field." Dr. Rene J. Dubos of the Rockefeller Institute for Medical Research, will set the stage for a two-weeks' study of man—from cell to organism, and his food—from soil to table, in an opening address.

Inquiries to Anne Bourquin, Ph.D., College of Home Economics, Syracuse University, Syracuse 10, N. Y.

The significance of staphylococcal disease in hospitals is further emphasized in this symposium. More important, however, is that these papers also demonstrate how much is still controversial in this area. The evidence is presented and it is up to the reader to weigh it and reach a conclusion.

ENVIRONMENTAL ASPECTS OF STAPHYLOCOCCAL INFECTIONS ACQUIRED IN HOSPITALS

I. THE HOSPITAL ENVIRONMENT—ITS PLACE IN THE HOSPITAL STAPHYLOCOCCUS INFECTIONS PROBLEM

John C. Colbeck, M.B.B.S., M.R.C.S.

THE IMPORTANCE of staphylococcal disease developed in hospital needs no emphasis. Many outbreaks have been reported in the past twenty years and a few long-time surveys have shown that staphylococcal disease is an important cause of morbidity even when an epidemic situation is not apparent.[1,2]

What are the reasons for this? The reasons may be summarized by stating that hospitals are institutions in which persons of more than normal susceptibility are exposed to unusual dangers of infection. The patients are particularly susceptible because they are debilitated, because they are newborn infants, or because they have artificial portals of entry created by surgery and other procedures. The risk of staphylococcal infection is greater than in ordinary life because some patients are admitted to hospital for the treatment of staphylococcal disease which has proved unusually harmful to the patient and resistant to treatment. These patients spread their staphylococci to their environment. The staphylococci of the septic cases have proved their human pathogenicity by the only known method, that is to say, the production of serious disease in man. It is therefore necessary to adopt stricter precautions than in ordinary dwellings.

Coagulase-positive staphylococci are present in the noses of many persons and may be present in their environment but epidemiological evidence shows that certain strains are much more likely than others to cause sepsis or hospital outbreaks.

The importance of the hospital environment is the subject of this paper. We have already suggested that hospital patients are particularly vulnerable and this is undoubtedly true, but the increased risk of infection and the development of disease even in healthy persons exposed to the hospital environment

is shown by a study in Vancouver. The incidence of boils and similar cutaneous lesions was studied in a group of nurses and hospital orderlies and compared with a group of clerical workers of similar age and economic status. It was found that 17 per cent of nurses and 24 per cent of orderlies had suffered one or more cutaneous septic lesions during a 12-month period. Only 5 per cent of the clerical staff not associated with the hospital reported infections during the same period. This investigation showed that the incidence of staphylococcal disease in a group of healthy adults exposed to the hospital environment was four times greater than that of a comparable group not so exposed. Later investigations, when the incidence in hospital staff was much reduced, showed a smaller difference.

Thus, it is shown that regardless of patient susceptibility there is an increased risk of staphylococcal disease in hospital. Our object is to decrease this risk and in order to do so we must discover the important methods of spread and provide practical and economic methods of control.

The term environment must be taken to include all the external contacts of a patient, including other patients, the staff, various inanimate objects, and the air he breathes. All may be important.

Seldom can reasonable proof of a method of spread or the efficacy of a method of prevention be established. Usually reliance must be placed on the notoriously dangerous post hoc ergo propter hoc argument. A procedure is introduced and infections decrease. Therefore the improvement is due to the measures adopted. It is not surprising, therefore, that there is little agreement on the relative importance of various methods of spread.

In the many publications relating to this problem, it appears that importance is often attributed to a single method of spread and no consideration is given to others. Direct contact with a person suffering from staphylococcal disease is the most obvious and readily proved method of spread. Staff treating cases with open staphylococcal lesions are likely to acquire infection and develop furunculosis. On the other hand, there are reports of surgeons and nurses with minor skin lesions infecting patients with sometimes fatal results. Any experienced worker in this field knows of instances which have never been published.

Bacteriological examination often shows heavy staphylococcal contamination of such inanimate objects in a hospital as bedding, baths, and toilet seats. The heavy infection of hospital blankets is well recognized and may be an important source of infection not only to the occupant of a bed but also to others as the result of air-borne infection. Early in our studies we found our blankets to be heavily infected and it is interesting that the staphylococcal counts of the hospital blankets were much higher than those of a few sampled on trains and in hotels.

We are particularly interested in the heavy contamination of mattresses which have received little attention in the literature. Infection will pass through a sheet to the mattress and from the mattress through the sheet to the patient. We found that mattresses kept in store for three months were still heavily infected and thus the infection of the mattresses may be cumulative unless they are protected or disinfected periodically. A patient nursed in a bed with clean sheets and blankets is exposed to infection from a mattress contaminated by a series of patients.

In a group of experiments, which we call "cleaned room experiments," rooms with adjacent toilet facilities were disinfected and the various articles tested for contamination with staphylococci. These rooms were in a compact unit

with a constant staff who had repeated nose swabs. Various types of patients were admitted to these rooms and the environment sampled on alternate days. We found that if the rooms were occupied by patients who were carriers or were suffering from staphylococcal disease, the bath, toilet seat, and bedside table sometimes showed heavy contamination with the same bacteriophage type of staphylococcus as that harbored by the patient. No evidence of significant infection of air or fomites could be traced to the staff.

If a bath was disinfected and shown to be free of staphylococci and then used once by a patient with boils, often hundreds of organisms could be recovered by swabbing an area of approximately six square inches at the "high water mark."

Aerial Infection

Air samples for staphylococci, taken at random with a Bourdillon slit-sampler in general wards and also in the "cleaned room" experiments previously referred to, showed very low counts of coagulase-positive staphylococci in the rooms of both septic cases and carriers. In rooms with no marked movement of bed clothes a series of observations in which a total of 500 cubic feet of air were sampled, 24 colonies were isolated. This figure was approximately doubled when the blankets were rapidly moved to the foot of the bed and back each minute during the five-minute sampling periods.

In staphylococcal disease the dose of organisms is very important. The counts found both in these experiments and during observations in the operating theaters show that the number of staphylococci likely to gain entrance into a wound from the atmosphere is very small and not likely to be important. Far more organisms are likely to be acquired by contact with the hands of carriers or the various objects previously mentioned. It must be remembered, however, that an adult breathes over 500 cubic feet of air in 24 hours and by filtering this large volume of air may become a carrier of the pathogenic hospital strains. It is probable that the importance of aerial infection depends chiefly on the production of nasal carriers among both patients and staff, who then infect their skin and environment.

There seems to be a tendency at the present time to give excessive importance to the aerial route as a direct method of spread of infection. If a nasal carrier is detected in a surgical team, the tendency is to assume direct aerial spread from the nose to the patient and to attempt to correct this by improved masking. I believe that since the hands and clothing of carriers are usually infected that the large numbers of staphylococci possibly transmitted by direct contact are a more important source of infection than aerial spread. These are not academic problems for they necessitate different procedures for their control. Chapin, who has been quoted as denying the importance of fomites, is even more critical of the importance of aerial infection in the spread of disease. To sum up the situation in regard to inanimate objects or fomites, one may say that many more staphylococci are likely to reach, for instance, a bed sore on a patient's back by direct contact with such articles as bedding or baths than are likely to reach the patient by aerial infection.

If then the dosage is higher from fomites than from the air, the only other argument that could be advanced against the importance of this source of infection is loss of pathogenicity of surviving organisms. In this regard it must be recognized that staphylococcal aerial infection in the vicinity of carriers arises chiefly from their clothing and not directly from exhaled air.

Therefore, such air-borne organisms must have the same pathogenic properties as those on the clothing and other fomites.

We have conducted many experiments on rabbits in an attempt to determine whether there is a loss of pathogenicity of staphylococci dried on textiles, and so forth, at room temperature under conditions similar to those encountered on the ward. A phage type 81 staphylococcus was passed through a series of rabbits and the subcutaneous infection of between 100,000 and 1,000,000 organisms suspended in broth induced abscesses in the vast majority of rabbits. Woollen threads were autoclaved and dipped in an overnight culture of this staphylococcus dried and kept at room temperature for various periods of time. In each experiment approximately six inches of an infected thread was drawn through the skin and subcutaneous tissue of a rabbit's back and then removed. A second infected thread was introduced and tied in place so that rather less than half an inch of woollen thread remained in the tissues. A third sterile wool thread was similarly sutured into the back of the same rabbit. Similar infected threads were thoroughly shaken in broth and counts made by pour plates at the time of each experiment. Rabbits were inoculated with threads which had been dried and retained at room temperature for 1, 2, 6, 7, and 14 days. The viable counts on the threads fell moderately with passage of time, but abscesses were induced in each of the three groups of rabbits in which threads dried from one to 14 days were tied in position. The calculated number of organisms present in the buried part of the ligature in these rabbits was approximately 100,000. Abscesses resulted from each of the pull-through experiments except the 14-day-old threads.

In another series of experiments, pus was removed from a subcutaneous abscess of a rabbit which had been inoculated with this strain of staphylococcus. The pus was smeared on glass slides and kept at room temperature at a relative humidity of approximately 50 per cent. After 1, 2, 3, and 11 days, the pus was then washed off the slides and three dilutions were injected subcutaneously into rabbits. Counts of viable staphylococci were made from the diluted material. At the same time three different dilutions of a fresh broth culture of the same staphylococcus were injected into the other side of the rabbits' backs. There was a marked tendency for the staphylococci to die off between seven and 11 days. The 11-day-old smears gave only 540 living organisms in the highest dose injected and no abscesses resulted. Comparison of the incidence of abscesses in rabbits injected with pus dried for 1, 2, and 3 days with the incidence of abscesses in rabbits injected with fresh cultures appeared to show that the surviving cocci had not lost their virulence, as compared with fresh cultures. The pathogenicity of the material appeared to depend on the number of surviving organisms present.

One human experiment was made with a woollen thread dried for ten days. In this experiment a superficial scratch was made on the skin and the woollen thread was rubbed on the linear scratch. After three days there was definite abscess formation, considerable edema and axillary adenitis. The experiment was then terminated with penicillin therapy.

Thus, we have shown that staphylococci are present in large numbers on many objects in the patient's environment and that surviving bacteria do not appear to lose their virulence.

The persistence of virulence of dried organisms is shown by the following experience. In 1948, I isolated a staphylococcus, now known as phage type 57, which was the cause of an epidemic

of breast abscesses and pyoderma in Winnipeg.[3] Some five years later an Australian bacteriologist asked me for a subculture. I had some neglected and dried up cultures in a jar on my shelf which had not been subcultured. Some tubes were broken and I removed eight unbroken tubes and passed them to my technicians who recovered small numbers of organisms from some tubes and negative cultures from others. Eighteen hours later I developed boils on two fingers which were due to this phage type which is very rare in Vancouver. The number of these old dry organisms which resulted in the boils must have been very small.

I believe that these experiments strongly suggest that inanimate objects may be a significant source of infection and this opinion is supported by a number of epidemiological observations which cannot be presented in detail here, but I will cite two suggestive instances. Before routine disinfection of blankets and mattresses was carried out in our hospital, we found that patients in certain rooms appeared to have more than their normal share of boils and similar infections. This no longer occurred after the disinfection of mattresses and blankets, and general cleaning of the rooms. The staff remained the same. The second sample concerns a family that had suffered recurrent boils for many months. Advice was given regarding household disinfection and hygiene with a good result. A few months later the intelligent father of the family, who had been opening up their summer home, developed furuncles. After disinfecting clothing, and so forth, at his cottage no further trouble was experienced.

Finally, I wish to emphasize the danger of a patient developing sepsis from organisms present in the nose on admission to hospital. It must not be assumed that because a patient develops frank staphylococcal sepsis in hospital that he has acquired the infection from the hospital environment. At the D.V.A. hospital, Vancouver, B.C., the rate of significant surgical sepsis was reduced to a low figure following various improvements of ward hygiene and surgical technic. At this time there was no bacteriophage type which could be designated as the "hospital strain." We considered the probability of the patients being the source of their own sepsis. We took nasal swabs on admission to hospital from 348 patients who were later subjected to surgery.[4] We found that the rate of clinically significant sepsis in nasal carriers was approximately sixteen times greater than that of patients who were not nasal carriers on admission. In each of the nasal carriers developing sepsis, the phage type in the nose was the same as that in the septic lesion. We had previously shown that those patients who carried staphylococci on the skin area prior to operation had a higher risk of staphylococcal infection.

These results show beyond doubt that at this time in this hospital infection brought into hospital by a patient was a more important source of his surgical sepsis than the hospital environment. This may have medicolegal importance. These findings also indicate the need for improved technics regarding skin disinfection and infection from the gastrointestinal and respiratory tracts of patients.

It shows a further lesson that there is no single method of control. Those who narrowly focus their attention on a single route or source of infection, such as infection in the operating theater, carriers among the staff, or various other isolated aspects of the problem will not achieve optimal results. The elimination of staphylococcal disease in hospital will never be attained, but much can be done if all probable routes of infection are properly assessed and controlled.

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II. SOME CONTROVERSIAL ASPECTS IN THE EPIDEMIOLOGY OF HOSPITAL NURSERY STAPHYLOCOCCAL INFECTIONS

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MANY OF THE PROCEDURES advocated for prevention of transmission of staphylococcal* organisms in the newborn nursery are based on assumptions that the nurse is an important carrier of the organism, that baby-to-baby transmission may take place and that staphylococci from dust and fomites may play an important etiological role. The beliefs are commonly expressed that if the nurse carrier is eliminated; if babies are not crowded in the hospital nursery; if nursery personnel adhere to rigorous hand-washing practices; and if the bedding, garments, floors, walls, and other items are sterilized then transmission of the organism is not likely to take place and, therefore, staphylococcal disease of the newborn is unlikely to occur.

Studies were designed based on the premise that the mechanism of spread could be elucidated by altering single or multiple factors in the nursery environment. It was assumed that if staphylococcal infection and disease were successfully controlled by these alterations, such control would constitute presumptive evidence that the mechanism of transmission had been interrupted and that the particular factor or factors altered would identify the particular mode of transmission. These studies were conducted in two Allegheny County, Pa., hospitals from March, 1958, through September, 1959. The following eight hypotheses, most of which may be classed as controversial, were tested: (1) That an observed decrease in staphylococcal disease/infection incidence in nurseries following institution of specific control measures indicates effectiveness of these procedures; (2) that the nose/throat carriage of staphylococcus by

* The term staphylococcus as used in this paper refers to coagulase-positive Staphylococcus aureus.

nursery personnel is relatively constant as regards phage type and persistence in time; (3) that staphylococci infecting newborns are of phage types present in the nose and throat of nursery personnel; (4) that nursery personnel with temporary or constant nasal carriage of staphylococci increase the chance of infants under their care being infected with these organisms; (5) that non-infected infants are at greater risk of acquiring staphylococcal infection of the nose, throat, or umbilicus if placed in close proximity to infected ones; (6) that markedly increasing the recommended nursery space allowance per baby results in a reduction of infection and disease due to staphylococcus; (7) that certain infants with nasopharyngeal carriage of staphylococci discharge recoverable quantities of these organisms into the air immediately surrounding them; and (8) that increasing the level of nursery asepsis through traditional environmental controls decreases the incidence in the newborn population of infection and disease due to staphylococcus.

Most of the studies here reported were conducted in Hospital A, a general hospital of 300 beds with a 30-bed nursery. Hospital B, which contained 600 beds, largely maternity, was more recently used. Under varying experimental conditions throughout the hospital stay, daily cultures of the nose, throat, and umbilicus were taken of babies included in these studies. Home visits were made from 10 to 14 days following discharge to determine the disease status of a sampling of infants. Both infection* and disease† incidence rates were used in an attempt to elucidate the role of the factors listed in the eight controversial hypotheses.

Hypothesis 1

An observed decrease in staphylococcal disease/infection incidence in nurseries following institution of control measures indicates effectiveness of these procedures.

Since control measures have as their purpose reduction of disease and infection rates, their success is sometimes considered proved on the basis of a reduction in disease/infection incidence following their application. The marked variability of both infection and disease incidence during study periods when conditions were presumably constant, suggests the need to examine the first hypothesis. Figure 1 demonstrates the fluctuation in incidence rates of groups of 25-35 successive births as they occurred during the studies. The four divisions in Figure 1 correspond to periods within each of which nursery personnell procedures and environmental conditions remained constant so far as could be determined. Description of the procedural differences between the four divisions will follow later. It may be noted that the fluctuations in infection rates among sets of successive infants within a division where conditions were apparently constant were as great as between periods when a new nursery procedure was instituted. The same fluctuations appeared in the disease rates. It may be added that when Hospitals A and B were studied simultaneously during the last three months portrayed in Figure 1, the infection rates were approximately three times higher in the latter hospital and the variations among successive groups of newborns in both hospitals were also great during that three-month period. Because of the observed marked variations in infection

* Infection is defined as the presence of coagulase positive S. aureus in the nose/throat and/or umbilicus of an infant at some time during his hospital stay.

† Disease is defined as the presence of clinical lesions (usually pyoderma or breast abscess) manifest in the first 14 days of life and from which coagulase positive S. aureus was recovered.

and disease incidence occurring under seemingly constant conditions, it should be emphasized that an isolated or single demonstration of a sudden decrease in incidence of either staphylococcal disease or infection following institution of specific control measures does not constitute proof of the effectiveness of such control measures.

Hypothesis 2

The nose/throat carriage of staphylococcus by nursery personnel is relatively constant as regards phage type and persistence in time.

Semiweekly serial nose and throat cultures for staphylococci were made during an 18-month period on all of the nurses and aides working in the nursery of Hospital A. The changing culture status of these 20 nurses and aides is shown in Figure 2. Here it may be observed that certain individuals, for example nurses 2, 11, 16, and 17, were negative or essentially negative for staphylococcus at all times during this period of observation. Similarly, certain personnel, such as nurses 7 and 14 and aide 6, were positive for staphylococcus essentially all of the time. Others varied greatly with extensive periods of positivity followed by equally extensive periods of negativity. Another pattern is exemplified by aide 3 who, over approximately a year, had only three brief periods of positivity widely separated in time. If cultures of this population at a given point in time were the basis for decision, it would have been impossible to distinguish persons whose long-term carriage pattern was persistently positive, persistently negative, or intermittently positive. The changing pattern of phage types carried by nurses and newborns is portrayed in Figure 3 by three-month periods. In the period April to June, 1958, the only typable strains of staphylococci found in the nurses were type 81. In the next period type 81 persisted and a new type 44A appeared. In the next period the frequency of isolation both of type 81 and untypable strains decreased; type 29/44A became one of the most prevalent types and type 7 appeared for the first time in the nurses. Similar changes may be noted in the succeeding three-time periods. Cultures obtained early in the study were retyped late in the study.

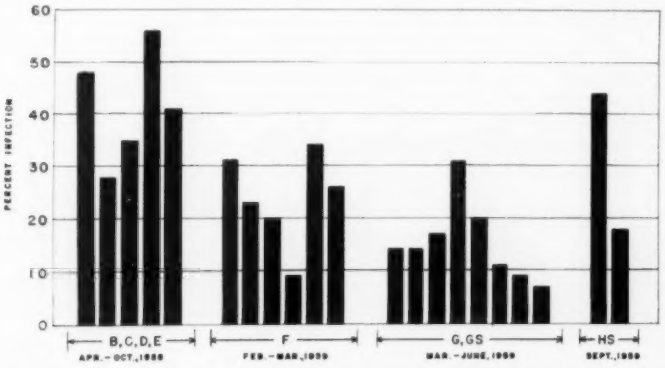

Figure 1—Weekly Incidence of S. aureus-Coagulase-Positive Infection in Newborn in Hospital A (Separated by Study Periods)

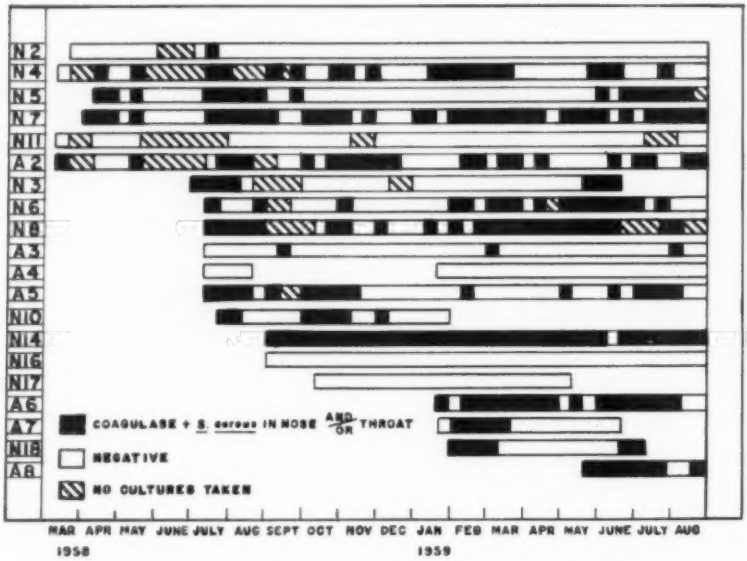

Figure 2—Staphylococcal Carriage in Nursery Personnel

and confirmation was obtained that the difference in prevalent types at varying time periods was not due to laboratory errors or to change in phage typing technics. It may be concluded that both the persistency of carriage of staphylococcus and persistency of type were quite inconstant in nursery personnel.

Hypothesis 3

Staphylococci infecting newborns are of phage types present in the nose and throat of nursery personnel.

The distributions of phage types of staphylococci in nurses and infants in any given period of time were quite dissimilar. This may also be seen in Figure 3. For example, in the July-September, 1958, period when infections by types 7 and 81/44A appeared in infants, no isolations of these types were made in nurses. Again, in the October-December period type 29/44A appeared among nurses but was absent in infants. It is evident, therefore, that babies acquired infections with staphylococcal phage types not isolated in semiweekly cultures from nursery personnel.

Hypothesis 4

Nursery personnel with temporary or constant nasal carriage of staphylococci increase the chance of infants under their care being infected with these organisms.

A study was designed to test whether or not babies receiving their entire nursery care from personnel harboring staphylococci were at increased risk of acquiring infection and disease. A group of eight self-contained bassinets was placed at each end of the large nursery in Hospital A and segregated by space from the remaining 14 bassinets in the

nursery. At the beginning of the study, nurses were divided into two groups: eight who had been persistent or relatively recent carriers of staphylococci and seven who had been consistently negative. Infants in one group of eight bassinets received total care throughout their hospital stay from the group of "noncarrier" nurses, while infants in the other group of eight bassinets received care from "carrier" nurses. The method of observation, i.e., daily nose, throat, and umbilical cultures, was the same as that previously described for other studies. The results are given in Figure 4. It may be observed that infants receiving care by "noncarriers" had, if anything, a higher infection rate than those cared for by "carriers." It should be added, however, that during the study period the carriage status of personnel in these two groups changed. Some of the "carriers" did not remain positive throughout the entire study period and three of the "noncarriers" became positive during this time. Most of the infections occurring in infants in the group cared for by "noncarrier" personnel were of phage types different from those carried by the three converters and, therefore, probably could not be attributed to them. An additional limitation of this study was the fact that although the infants and nurses in the two study groups were located in widely separated parts of the main nursery, they nevertheless shared a common environment. Despite the obvious shortcomings of this experiment, it seems warranted to conclude that at least in this nursery, infants cared for by personnel who were carriers of phage typable staphylococci were not at greater risk of infection than were infants cared for by noncarriers.

Hypothesis 5

Noninfected infants are at greater risk of acquiring staphylococcal infec-

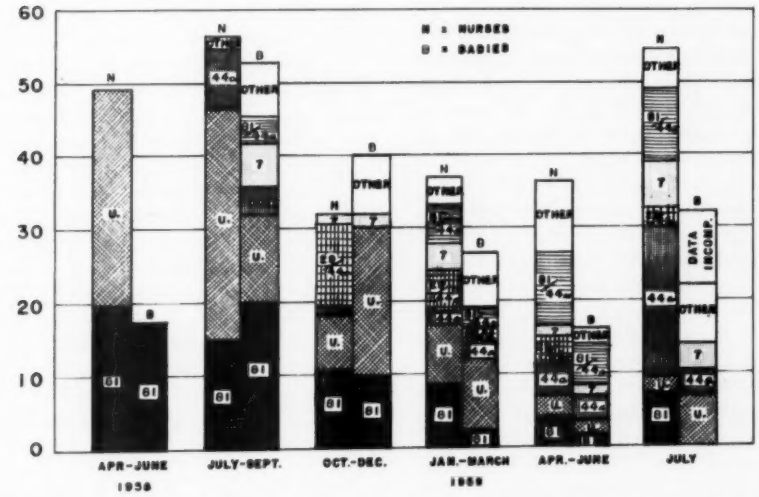

Figure 3—Distribution of Phage Types in Nursery Personnel and Newborns by Time Periods

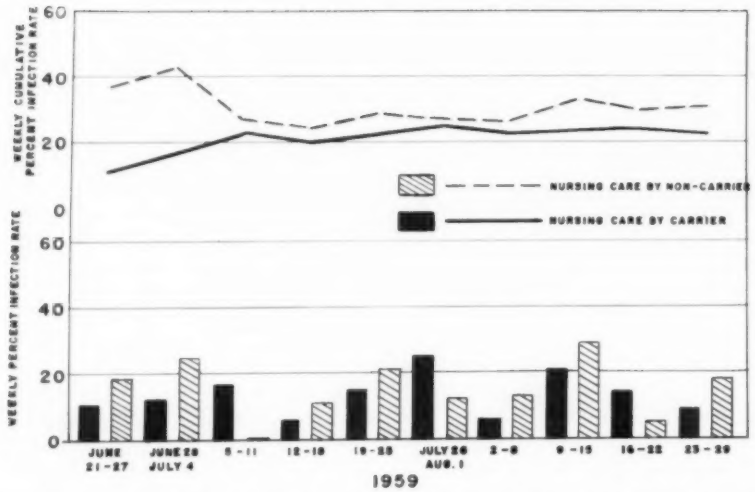

Figure 4—Weekly and Cumulative Staphylococcal Infection Rates by Week of Birth for Infants Given Total Nursing Care by Carriers or Noncarriers of Staphylococcus aureus

tion of the nose, throat, or umbilicus if placed in close proximity to infected ones.

To determine whether or not infected infants transmitted organisms to spatially associated noninfected infants, two studies (Series F and G) were conducted. In Series F, the 30 bassinets in the nursery were numbered and arranged in seven groups, six containing four bassinets and one containing six. The position of each bassinet was maintained by means of floor markings. Figure 5 shows the arrangement in the nursery. Initially, babies were placed in groups according to age, the oldest being placed in the first group, the next oldest in the second, and so on. Thereafter, babies were admitted serially to the numbered bassinets, thus remaining grouped according to age and spatially separated from babies of different ages. Only babies of the same group received routine care at the same time, and all were hand-carried individually to their mothers. The 210 infants in Series F had nose/throat and umbilical cultures within the first 24 hours of life and daily thereafter until discharge from the hospital. In addition, approximately half of these babies were examined and cultured after they had been home from 10 to 14 days. Forty-eight infections occurred in the 210 infants observed, but in only six instances were staphylococci of the same phage types found in infants spatially associated.* (In 12 other cases strains cultured from associated pairs of babies were untypable and it is impossible, therefore, to say whether or not these strains were of the same type.)

In Series G, babies of differing ages were randomly arranged in groups. As babies were discharged, newborns were assigned to the vacated bassinets in a random fashion, subject only to the re-

* Two infants were considered spatially associated if they occupied bassinets in the same or contiguous groups during the same time period.

striction that successive admissions not be placed in the same group. This procedure, on the average, resulted in groups of four babies, one of whom was one or two days old, a second two or three days, a third four or five days; and a fourth of any age. A total of 115 babies was studied, and home visits were made on all. In all other respects Series G was identical with F. Fifteen infections occurred in Series G infants, of which only three of the same phage type were present in spatially related infants. It may be concluded that there was very little evidence of baby-to-baby transmission regardless of the age arrangement; and, indeed, when babies of varying ages were intermixed (Series G), the infection rates were lower than when they were grouped by age (Series F).

As part of the Series F and G studies, infection rates were compared of infants who had been kept in bassinets in various parts of the nursery. These observations were made to determine whether there were certain areas in the nursery which might be environmentally disadvantageous to the infants; for instance, adjacent to marked work activity and traffic, near doorways, or next to laundry hampers. The infection rates in different nursery locations are given in Figure 5 for the two series. While the number of different babies observed at a given location was rather small, location V in Series F and locations I and VI in Series G showed a marked variation in infection rates over the general average. The failure of location V to be high under the second plan and I and VI to be low under the first plan suggested this variation was probably a chance phenomenon. It may be concluded that there was no location in this particular nursery which seemed to be particularly disadvantageous to infants.

Hypothesis 6

Markedly increasing the recommended nursery space allowance per baby results in a reduction of infection and disease due to staphylococcus.

Two contiguous nurseries in Hospital B were employed for this study. These had nursing personnel in common, were physically identical, and employed self-contained bassinets. The occupancy in one of the nurseries was maintained at or near the full capacity of 29 babies while the other nursery was maintained at approximately half capacity by keeping alternate bassinets empty at all times. A total of 575 babies was observed dur-

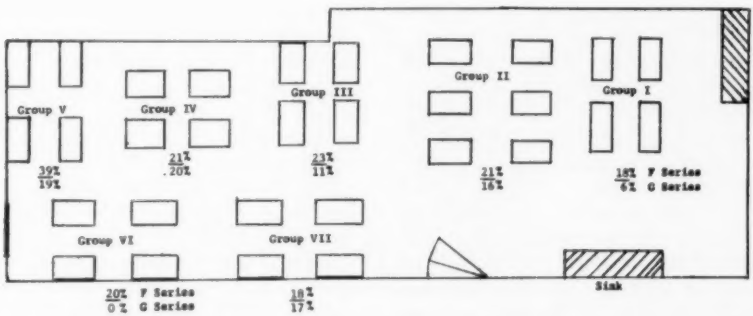

Figure 5—Staphylococcal Infection Rates and Floor Plan for Baby Placement Series F and G in Hospital A Nursery

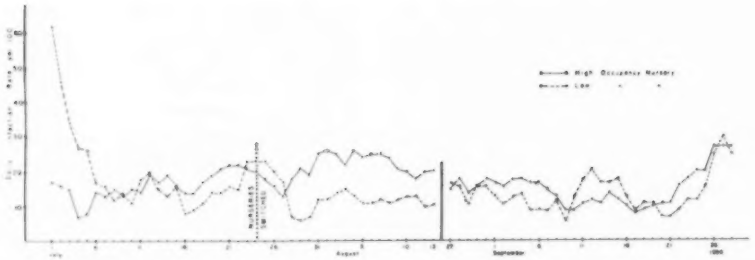

Figure 6—Effect of Newborn Population Density on Staphylococcal Infection Rates in Hospital B, 1959

ing a 12-week period. Daily nose/throat and umbilical cultures were made on each infant during the hospital stay, and home observations and cultures were made on 126 babies. In order to obviate any inapparent environmental difference in the two nurseries, at the end of four weeks the high and low occupancy nurseries were reversed by moving babies and their bassinets from one nursery to the other. The nursery walls and floors were washed with disinfectant at the beginning of the study and again at the point when locations were reversed.

The daily incidence of staphylococcal infections in the infants in the high versus the low occupancy nursery is given in Figure 6. In the first four weeks, the incidence was essentially the same in the two nurseries. In the next period of four weeks there was a trend toward lower incidence in the low density nursery, but in the final period the rates in the two nurseries again were approximately the same. The incidence of staphylococcal disease in the high and low occupancy nurseries during the first eight weeks of the study were 20 and 16 per cent, respectively. It may be concluded, therefore, that there was no evidence that a two-fold increase in nursery space allowance per baby had any appreciable effect on either the incidence of disease or infection in the newborn infants in this study.

Hypothesis 7

Certain infants with nasopharyngeal carriage of staphylococci discharge recoverable quantities of these organisms into the air immediately surrounding them.

For a period of one month prior to the beginning and subsequently throughout the study described in connection with hypothesis 4, air samplings were taken in the nursery. Five cubic foot samples with a Casella Slit-Sampler were taken daily at each of 18 bassinet locations within the nursery. The air intake of the slit-sampler was positioned within 24 inches of the head of the baby occupying the bassinet and level with the top of the bassinet. The average results of these air samplings for locations within the two groups of babies are given in Figure 7. Five isolations of staphylococci were made from the air during the month prior to the beginning of the study. However, no isolations were made during the study period even though samples were taken in the vicinity of infants with positive nasopharyngeal carriage of these organisms. The phage type of the organisms recovered in the air samples cannot therefore be related to the type harbored by infants in adjacent bassinets. In Hospital B during the same time period and with the same technic, numerous isola-

tions of staphylococci were made from the air in the nursery. However, these organisms were of phage types different from those present in infants in the nursery. Technical difficulties, therefore, were not the explanation for the failure to recover staphylococcus from the air of Hospital A. As may be observed in Figure 7, total bacterial counts varied considerably, and particularly in the second nine weeks there seemed to be two periods with higher recovery of organisms. During neither of these periods was there a corresponding change either in disease or infection in the infants. It may be concluded that air adjacent to known positive infants when sampled on numerous occasions failed to yield recoverable quantities of staphylococci.

Hypothesis 8

Increasing the level of nursery asepsis through traditional environmental controls decreases the incidence in the newborn population of infection and disease due to staphylococcus.

This hypothesis was tested in a special six-bed nursery in Hospital A. A total of 51 infants received their total care under the following rigidly aseptic conditions: (1) The room was painted and then washed thoroughly with disinfectant at the start of the study period; (2) the floors, flat surfaces, and bassinets were disinfected daily; (3) mattresses, bedding, and garments were all autoclaved; (4) nurses caring for infants wore sterile gowns and masks; (5) nurses used hexachlorophene solution to wash their hands on entering the room and between each baby contact; (6) new air filters were placed in the window air conditioner at the beginning of the study; and (7) ultraviolet lights directed toward the ceiling were also used in the room.

The special nursery was kept filled to capacity, a new infant being admitted as soon as a vacancy occurred. Following an admission to the special nursery, the next two births were admitted to the regular nursery and included in the study as part of the "control group" which ultimately numbered 102 babies. In the first part of this study, six infants in the special nursery and 12 in the general nursery were observed at a time and cultured daily. In addition, from 10 to 14 days after discharge they were cultured at home. In the second half of the study, the numbers studied

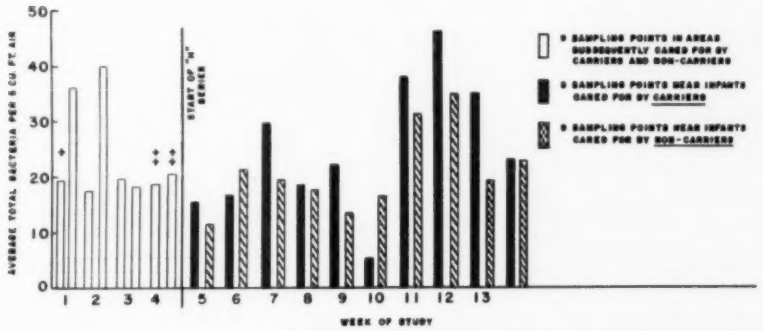
AVERAGE TOTAL BACTERIA PER 5 CU. FT. AIR
50
40
30
20
10
0
START OF "A" SERIES
1 2 3 4 5 6 7 8 9 10 11 12 13
WEEK OF STUDY
SAMPLING POINTS IN AREAS SUBSEQUENTLY CARED FOR BY CARRIERS AND NON-CARRIERS
SAMPLING POINTS NEAR INFANTS CARED FOR BY CARRIERS
SAMPLING POINTS NEAR INFANTS CARED FOR BY NON-CARRIERS

Figure 7—Average Total Bacterial Count in Air Samples in Staphylococcal Carrier and Noncarrier Groups—August, 1959 (+ indicates one colony of S. aureus, Coagulase-Positive Recovered.)

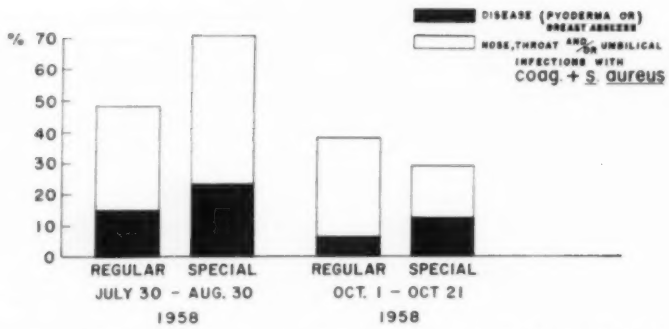

Figure 8—Staphylococcal Infection and Disease Rates in Newborns Receiving Care in Regular and Special Hospital Nurseries

at one time were reduced to four and eight, respectively. Throughout the study period, the same nursery staff served both rooms. Results are shown in Figure 8. In the first time period it may be observed that both infection and disease rates were somewhat higher in infants receiving special aseptic care than those receiving normal care. In the second period the disease rate was higher in the special than in the general nursery whereas the infection rate was somewhat lower. While a full explanation of these observations cannot be given, it is clear that under the conditions of this experiment, the use of measures designed to increase asepsis failed to reduce the incidence of both disease and infection in the infants.

Discussion

The studies reported here involving manipulation of single or multiple factors have failed to elucidate mechanisms of transmission of staphylococcus in a newborn nursery. Among the possible explanations for this failure, four of the most plausible are: (1) the factors selected for study were not the essential factors in transmission; (2) the design of these studies, which largely tested single factors, was inappropriate since the demonstration of the effect of manipulation of a single factor may likely be masked by variation in the effects of other factors, or, indeed, may only be demonstrable when several factors are simultaneously manipulated; (3) the factors chosen for study, singly or in combination, were essential factors in transmission, but were not effectively manipulated or controlled; and (4) the classifications made were inappropriate and the analyses were inadequate.

1. Omission of Essential Factors—The question of omission of the essential factor or factors from the study must remain unanswered. However, some of the factors commonly considered important in the spread of staphylococcal infection, i.e., nurse-to-baby transmission, baby-to-baby transmission, crowding, and so forth, were separately and collectively investigated and found, within the limits of these studies, to have no detectable effect. Possible "essential" factors which were not manipulated in these studies might be: some aspect of the environment or technics used in the delivery room through which all infants entered the hospital; the nursery air; the environment outside the nursery to which the infant was exposed from four to six times daily when carried through the hospital corridors to the mother's room for feeding.
2. Inappropriate Study Design—Several possible mechanisms of transmission of staphy-

lococcus have been suggested. It may be argued that studies designed to impose a barrier to one mechanism by controlling a factor or factors thought to be important in this mechanism, are likely to fail to demonstrate an effect. This failure could be the result of the continued operation of other mechanisms of transmission with varying effectiveness through time. In such a situation, the effect of controlling a factor in one mechanism could go unnoticed with the designs employed. Further, transmission may be discontinuous in the sense that contamination occurs in bursts from different sources during different periods of time. Therefore, cumulating results over rather long periods of time could well mask real effects of the factors varied in the study. These possibilities of multiple mechanisms and discontinuity of spread would seem likely not only on the basis of knowledge of the characteristics of the staphylococcus and other pathogenic organisms, but also from an over-all view of the studies here reported.

3. Ineffective Manipulation of Factors Studied—It is quite conceivable that the factors selected for study do have importance in the transmission of staphylococcus to the newborn but that the studies conducted failed to demonstrate their importance for one of several reasons. Perhaps the levels of the factor represented in the experiments were not sufficiently different. For example, a doubling of the nursery floor space per baby might not have been enough to produce a detectable difference, while increasing the floor space by a factor of four, ten, or more would. Perhaps the experiments involving modifications of nursing procedures were vitiated by failures on the part of personnel to follow the prescribed routines rigidly and continually.
4. Inappropriate Classification and Inadequate Analyses—Important properties of the host (infant), the agent (staphylococcus), and their interaction (infection, disease) might not have been identified because meaningful classifications of characteristics were not established or because specific technics and tools of investigation were lacking. For example, it was not known how to classify infants according to their "native" susceptibility or resistance to staphylococcal infection and disease. Likewise, technics and procedures were lacking to distinguish accurately pathogenic from nonpathogenic staphylococci or to label strains with sufficient specificity to follow their spread in the nursery population and environment. The procedures for identifying pathogenic organisms by color, colonial characteristics, and coagulase production and for labeling specific strains by phage typing were not entirely satisfactory. In the area of host-agent interaction, it might have been enlightening to classify infants not only as positive or negative for staphylococcal harborage but also in respect to the day of life of first positivity, intermittancy or constancy of recovery of organisms, quantity and specific strains recovered, and body sites of infection. Also, it might have proved helpful to distinguish between circumstances in which organisms were recovered because they were present by chance on the body surface or in an orifice sampled from those in which recovered organisms represented established infection. Finally, meaningful information might have been obtained by classifying disease in the host according to day of onset, severity of lesions, and quantity and specific strains of organisms recovered.

Despite the difficulties mentioned and mindful of the possible explanations for the negative character of the findings, it was the opinion of the investigators that the design of the studies and the quality of the observations made were adequate to test the eight hypotheses as stated, involved sufficient numbers to give statistical significance to the findings, and at least equalled the standards prevailing in other epidemiological studies of the staphylococcal infection problem.

These studies demonstrate that for the levels of the factors chosen for test (the degree of crowding, the levels of staphylococcal carriage in the nursery personnel, the extent of spatial separation between infants, the degree of asepsis attained, and so forth) no measurable effects on staphylococcal infection and disease rates were detectable that could be attributed to variation in these factors. The conclusion, therefore, seems warranted that the hypotheses advanced remain unproved and therefore controversial. Additional studies under varying circumstances of location, personnel, amounts, and kinds of infection and disease are required before a decision can be made

as to whether or not currently advocated control measures for staphylococcal disease in newborn nurseries are effective and practical.

ACKNOWLEDGMENT—The assistance and cooperation of many individuals were essential in carrying out these studies. We should particularly like to acknowledge the help of the administration and medical and nursing staffs of the two study hospitals: Drs. Frank Lukez, Guillermo Valverde, and Robert Yee; Wilma Bradley and Mary Kay Johns; Harry Brady, Gory Love, Richard Paul, Paul Sheehe, Edward Tessaro, and Joseph Yomtob.

Dr. Gezon is professor of epidemiology and microbiology, Dr. Rogers is associate professor of maternal and child health, Dr. Thompson is professor of biostatistics, and Mr. Hatch is professor of industrial health engineering with the University of Pittsburgh Graduate School of Public Health, Pittsburgh, Pa.

This paper was presented before a Joint Session of the Engineering and Sanitation, Epidemiology, Medical Care, Occupational Health, and Public Health Nursing Sections of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 21, 1959.

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III. VENTILATION OF OPERATING ROOMS—BACTERIOLOGICAL INVESTIGATIONS

Robert Blowers, M.D., and K. R. Wallace, M.B., Ch.B.

JUST ABOUT A YEAR AGO one of my colleagues, Dr. Robert Williams, spoke at a national conference on hospital acquired staphylococcal disease, organized by the U. S. Public Health Service and National Academy of Sciences.[1] He reviewed the problem of staphylococcal infection in hospitals and he gave an account of the ways we are exploring in Britain in our search for its solution. It would be tedious if I were to cover the same ground again. Moreover, my knowledge of this subject is not as broad as Dr. Williams' so I shall discuss here, perhaps in a little more detail, only one of the subjects that he mentioned in his survey. This is the control of air-borne infection in operating rooms. I shall pay special attention to the ventilation of these rooms but I will first discuss the background to our investigations before telling something about the results.

Before we go to a lot of trouble devising new methods of ventilation for operating rooms we should satisfy ourselves that there really is a need for them. We should satisfy ourselves that the risk of air-borne infection during an operation really does exist. Lister, in the 19th century, believed that it did exist. But for many years after that, air-borne infection was not seriously considered as an explanation for

the sepsis that occurred from time to time. It was not, in fact, possible to study it on a scientific basis until 1933 when Wells[2] developed the air-centrifuge for counting the number of contaminated particles in the air. In 1941 the bacterial slit-sampler was introduced by Bourdillon, Lidwell, and Thomas.[3] This machine is particularly useful because it can relate the time of appearance of contaminated particles in the air to events taking place in the room. Its use in operating rooms during the last fifteen years has given much valuable information. But we should not forget an older and simpler method for studying the bacteriology of air—the exposure of plates of culture medium. On these plates, contaminated particles are deposited by gravity and are also thrown on to it by currents of turbulent air. They give information that cannot be obtained from the air-centrifuge and slit-sampler. The number of particles that contaminate an exposed surface depends on their concentration in the air, their density and size, and the amount of air impinging on the surface. The volumetric type of sampler measures only the first of these. The simple sedimentation plate takes account of and integrates them all.

In 1946 Bourdillon and Colebrook,[4] of the Birmingham Accident Hospital, found that the air in burns dressing rooms was loaded with bacteria. Many of these organisms came from sources inside the room—from wound-dressings, blankets, and the clothes of the dressing-room staff as they moved about their duties. The simple ventilation plant then in use was not able to prevent accumulation of these organisms. But more than this, the ventilation plant, consisting only of exhaust fans, was sucking contaminated air into the dressing room from other parts of the hospital. It seemed reasonable to reduce this contamination as Hart's earlier investigations had already suggested.[5] Lowbury[6] showed by a controlled trial in a burns unit that doing this by improved methods of ventilation really does cut down the amount of sepsis.

We now know that these things are true not only for burns dressing rooms but also for general surgical operating rooms. For example, my colleagues and I[7] investigated a chest surgery unit where Staphylococcus aureus infections were causing serious trouble. By improved ventilation and by other methods we reduced the bacterial contamination of the operating-room air. The frequency of wound sepsis fell from about 11 per cent of all operations to about 5 per cent and has now settled down at about 2 per cent. But this experience of ours was not conclusive proof of the importance of air-borne infection because at the same time as changing conditions in the operating room we also introduced improved technics in other parts of the hospital. A more conclusive experience was that of Shooter and and his associates[8] who reduced the frequency of sepsis by reducing the number of bacteria in the air of the operating room and by making no other changes at all.

From all this we must conclude that air-borne infection of wounds during a surgical operation is, sometimes at any rate, a considerable hazard. But this is only one aspect of a complex problem. It would be wrong to concentrate our attention on air-borne infection and to ignore important defects in other matters of surgical and nursing procedure. Nevertheless, my purpose is to discuss this particular problem and I want to further the subject by asking two questions, and by trying to answer them.

The first question is this: Can we define a bacteriological standard of safety for the air of an operating room? In an attempt to do this, let us examine the results of air-sampling during operations and put them alongside the sepsis records that are associated with them.

Table 1—Slit-Sampler and Sedimentation-Plate Counts During Surgical Operations. These Are Not Actual Results from a Particular Operating Room but Are General Indications of the Usual Findings.

Slit-Sampler Contaminated Particles per Cubic Foot of Air		Exposed Sedimentation Plates Contaminated Particles Settling per Square Foot per Minute		
General Count	Staph. aureus: General Ratio	General Rate	Staph. aureus Rate (Approximate)	
20–50	1:20	10	0.5	Much sepsis
1–2	1:100	0.5	0.005	Less sepsis

Examples of these are shown in Table 1. In the first column are the general bacterial particle counts from the slit-sampler. These are the counts of all visible colonies—whether pathogens or not—developing after 18 hours' incubation on a simple nutrient-agar medium. When the general counts lie between 20 and 50 per cubic foot there is usually a great deal of sepsis arising from operations in that room. Associated with these counts of 20-50 per cubic foot we find several other interesting things. On the slit-sampler plates, the ratio of coagulase-positive Staphylococcus aureus colonies to the general colony count may be as high as 1:20. And we may find that exposed culture plates collect contaminated particles at about 10 per square foot per minute. These sedimentation samples are usually too small to allow direct measurement of Staph. aureus sedimentation rates. But if the Staph. aureus: general count ratio from the slit-sampler plates is assumed to apply to the sedimentation plates—though this may be an unjustifiable assumption—the Staph. aureus sedimentation rate would be about 0.5 particles per square foot per minute. During an operation the area at risk of contamination includes the wound, the hands of the surgeon and his assistants, the instruments, swabs and dressings, and the tables on which these things are placed. If these cover an area of, say, 20 square feet, particles contaminated with Staph. aureus may fall on it at the rate of about 600 an hour. Most of these particles contain only a few cocci[9] but each of them is a potential danger to the patient. Some workers[10] have recorded sedimentation counts much higher than ours because of differences in the conditions of exposure. These must be standardized if comparable results are to be obtained. If they include the periods of heavy contamination at the entry and departure of the patient, the mean sedimentation rates are much higher and the effect of the two peaks on the mean rate for the whole period is unduly influenced by the duration of the operation. To eliminate this variable factor we suggest that plates should be exposed from the moment of the first incision until the tying of the last stitch. Our sedimentation results have been calculated on this basis.

If we now turn to operating rooms where very great efforts have been made to reduce aerial contamination, the counts may be as low as those of the second example in the table. General counts may be only 1-2 per cubic foot; the Staph. aureus: general ratio may be 1:100 or even less; general sedimenta-

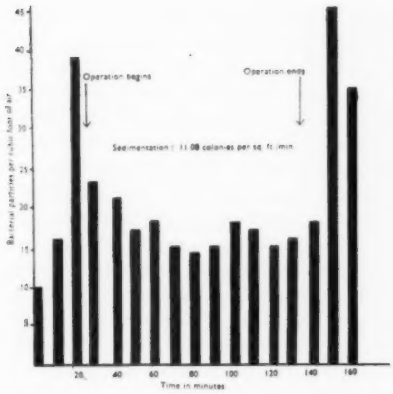

Figure 1—Air Sampling During Operation with Exhaust Ventilation and Much Activity; Theater Doors Opened 55 Times

tion rates may be as low as 0.5 contaminated particles per square foot per minute and our crude calculation gives a Staph. aureus sedimentation rate of about 0.005/sq ft/minute. With counts like this there is usually very much less sepsis. But we are not able to say how much of the sepsis that does occur under these conditions is still due to air-borne infection in the operating room or to other causes. And so, we cannot say whether an acceptable limit of safety for the air in operating rooms lies somewhere between these two sets of observations or whether even lower counts would give still better results. Before we can settle this matter and define our standards of safety for the air in an operating room we need to examine many carefully kept records of sepsis alongside the air-sampling results. There we must leave this matter for the time being.

This brings us to the second question: If we want to reduce the number of air-borne bacteria in an operating room, how do we do it? The first thing to do is to make sure, from smoke tests, that the ventilation plant is not sucking hospital air into the operating room. Modifications of the ventilation plant to prevent this were made in one hospital that we investigated, and Figures 1 and 2 show that the slit-sampler counts were reduced to about a third. But still more can be done. In this particular operating room we next made sure that no unsterilized blankets were brought in to cover the patient; that nobody in the room wore ordinary street clothes or ordinary hospital uniforms under their gowns; and that nobody went in or out of the room during the operation. During most operations, nurses trot back and forth to the clean-up, sterilizing, and workrooms about fifty times during an operation. Sometimes they go to fetch equipment that could have been in at the beginning; sometimes to take out equipment that could remain in until the end; and sometimes they go in and out for reasons that I have never been able to discover. If all this is stopped, bacterial counts are reduced even more. Indeed, in this particular operating room, we introduced these precautions and then,

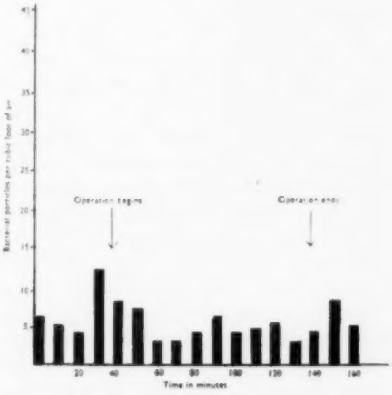

Figure 2—Pressure Ventilation and Much Activity; Doors Opened 47 Times

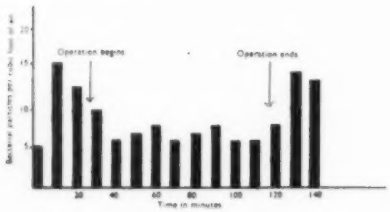

Figure 3—Exhaust Ventilation and Reduced Activity; Doors Not Opened

because of a mechanical breakdown, temporarily reverted to the old ventilation system. The new operating room discipline alone gave an improvement almost as great as that from the new ventilation system (Figure 3). It was only when good ventilation was combined with the new operating room discipline that we saw the best results (Figure 4). In a few good units we have been able to maintain this very low level of contamination. But in many others, where the discipline or the standard of organization is not as high, we have been unable to prevent the many journeys in and out of the room that keep the counts up. So we are looking for ventilation methods that will yield these lower counts more easily.

The Newcastle Regional Board and the Public Health Laboratory Service have built, in the Public Health Laboratory at Middlesbrough, a full-sized dummy operating room. In it we first re-examined the conventional methods used for pressurizing a room to prevent in-flow of contaminated air. This is usually done by arranging for the air input fans to have a slightly greater capacity than the exhaust fans. This works well when all the doors are closed and only a small volume of air leaks from the room; but it is unreliable when the doors are open because the small surplus of air is insufficient to cause strong outward flow through all parts of the large opening. We have, therefore, discarded forced extraction of air and rely on free escape through ports low down on each wall, fitted with simple, weighted flap valves. When a door is opened, pressure in the room drops, the valves close and the entire air supply is available to give a strong outward draft through the door opening.

Removal of organisms that have been liberated inside the room is a more difficult problem. Ventilation plants for doing this are of three main types: First, a stream of air may be aimed, obliquely or horizontally, at the center of the room to create turbulence and prevent stagnation of contaminated air in the area enclosed by the lamp and the ring of people and equipment round the patient. Second, air may be introduced at the top of the room so that, with mild turbulence, it mixes rapidly with air already in the room. By this method, contamination is reduced by a constant process of dilution. Third, air may be brought in at the top of the room in such a way that there is the least possible turbulence and little mixing with the contaminated air, which is thus removed by downward displacement.

The merits and disadvantages of these three systems are being examined in

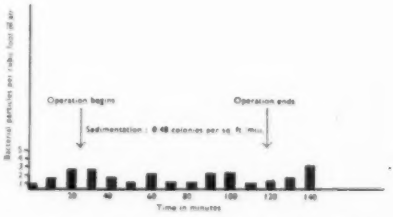

Figure 4—Pressure Ventilation and Reduced Activity; Doors Not Opened

(Figures 1-4 published through courtesy of John Wright & Son, Ltd., London, England, from "Medical Annual," 1958.)

several ways. In the dummy operating room we liberate a cloud of nonpathogenic bacteria to give uniform contamination of the air. We then assess the performance of each ventilation system by observing two things. We measure, with the slit-sampler, the speed at which the organisms are removed; and at the same time, we record the numbers of them that are deposited, during the process of removal, on an exposed culture plate representing the wound.

We find that the downward displacement or "piston" method of ventilation removes organisms more quickly than the other methods; and that fewer organisms are deposited on the exposed plate during removal. Some of the turbulent systems are fairly effective for removing the bacteria, but they all do so at the expense of heavy deposition on the exposed plate. This is not surprising because the number of organisms that come in contact with a surface depends not only on the concentration of bacteria in the air but also on the amount of air impinging on that surface. With turbulent systems of ventilation the amount of air impinging on the wound is greater than from a system with a uniform downward movement.

Before we could investigate these methods we had first to find out how to produce a good downward displacement or piston movement of air. We had to give careful attention to the number, position, and design of the high-level air-inlet ports and the low-level outlet ports. If any heating was needed it had to be provided by the ventilation plant itself and not by heating panels. The efficiency of a ventilation plant in removing bacteria is considerably influenced by the difference in temperature of the air coming in at the top and the air already in the room. It is lowest when we put cold air into a hot room and highest when warm air comes into a cool room. We realize that there are many parts of the world where ventilation with cold air is often essential. But when heating is necessary let us, if we want piston ventilation, take advantage of this effect by letting the ventilation plant do all the heating during operations. If heating panels are needed to maintain wall and room temperature when the ventilation plant is out of action, they should be turned off when the ventilation plant is switched on. Finally, we could maintain a good piston movement of air only if the scrub, sterilizing, and other annexes adjoining the operating room were separated from it by doors, which were kept closed during operations.

The methods of assessment that we have used depend on clearance of bacteria from a uniformly contaminated room. But during surgical operations, bacteria are probably liberated irregularly by people in different parts of the room. The ventilation methods that take these organisms away without carrying them across the wound area may not be those we have found most suitable for uniform clearance of uniform contamination. To investigate this point Drs. R. E. O. Williams and O. M. Lidwell of the Air Hygiene Laboratory in Colindale have used an infra-red gas analyzer to trace the flow of nitrous oxide liberated as a tracer in different parts of the room. I am grateful to them for giving me permission to mention their incomplete and unpublished results. They find that for contamination arising close to and above the level of the operating table, mildly turbulent ventilation gives the lowest concentration of gas in the region of the wound. For contamination arising below the level of the table or well away from it, the downward displacement system is more effective. We must now know if these results are valid for particulate as well as for gaseous contamination. If they are, we must discover exactly where staphylococci are discharged into the air during an opera-

tion. Is the main risk from particles that are disturbed from the floor, or do they come directly from the carriers? Does most contamination come from the relatively still people close to the patient or from the more active ones further away? There is already evidence that Staph. aureus is rarely shed from the respiratory tract of nose and throat carriers; and that many come from the body and clothes of skin and perineal carriers. Do these people liberate most of their staphylococci from sites above or below the belt?

It has not been my purpose, in this short paper, to say how an operating room should be ventilated but, rather, to give some facts on which the method must ultimately be based. All the facts that we need are not yet available, but even when they are we must remember that a new, chromium-plated operating room will not prevent infection. This can only be done by the people who work in it.

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IV. PROCEDURES APPLICABLE TO SAMPLING OF THE ENVIRONMENT FOR HOSPITAL USE

Lawrence B. Hall, M.S., and Herbert M. Decker, M.S.S.E.

IN THE LAST FEW YEARS, hospital cross-infections have received unprecedented attention, particularly those involving Staphylococcus aureus. Many investigators in research institutions and in individual hospitals are studying the problem. Intensive work is going on in the bacteriology and the epidemiology of these infections, but the tools with which to work are still somewhat lacking. A conference on the relation of the environment to hospital acquired staphylococcal disease, sponsored by the Communicable Disease Center and the National Research Council last December, emphasized the fact that the entire area is short on quantitative studies.

Strictly quantitative technics have not been developed which are adaptable to all types of bacteriological sampling. In some situations we are of necessity limited at present to methods which are at best only semiquantitative.

However, many improvements have been made recently in sampling technics, particularly in air sampling, and wherever possible these improved quantitative technics should be used. It is not enough to merely know whether or not Staphylococcus is present; we also require knowledge of the extent of the contamination. Thousands of organisms are obviously more dangerous than just a few.

The requirements for studies of human sources, be they carriers or frank infections, are necessarily largely qualitative in nature, but if the comparative importance of the routes of transmission through the environment are to be evaluated quantitative methods are essential.

Before considering actual equipment and technics it would be well to review the theories of transmission as we see them today. There is, first, the direct contact, illustrated by the transfer of organisms directly from a carrier to a susceptible by contact of the two human beings through, say, a break in a rubber glove. This route of transmission hardly lends itself to quantitative evaluation, nor is there much of a need for quantitation in this situation. We are sure the route exists. The majority of the aseptic technics of surgery are used with this in mind.

All other theoretical routes of transmission pass, of necessity, through the environment in one way or another. In the environment they may be studied quantitatively with varying facility and accuracy.

The first of these routes through the environment is by means of droplets which, propelled by coughs and sneezes, move at high speed from the human source to the susceptible. The period of time involved varies, probably, from microseconds to seconds. This route has been classified by many as "direct" because the organisms remain in their original body fluids during the period of transfer. Nevertheless, the droplets do move through the air, a part of the environment, where they may be captured.

Less direct may be the droplet nuclei, the organisms themselves, which remain in the air after the rapid evaporation of the body fluids in which they leave the human source. These may, under some circumstances, move directly from the source to the susceptible human in

periods ranging from microseconds to hours, but they move through the environment from which they may be recovered and quantitated.

All three routes, droplets, droplet nuclei, and contact serve to contaminate the fomites of the environment, including air, dust, food, linens, instruments, floors, walls, and all other objects large and small. From the fomites the organisms may pass to the host by direct contact or they may be resuspended in the air, by themselves or attached to dust particles, thence to settle on or be inhaled by the host.

Methods are available for qualitative examination of direct contact, only semiquantitative methods are available for the examination of droplets and the contamination of fomites, but methods are available for the quantitation of droplet nuclei and similar particles suspended in the air.

Certain of these methods are rather simple, require a minimum of equipment and are suitable for more or less routine hospital use. Other methods are more complex and require the equipment and meticulous operation usually associated only with research. The accuracy of results is in most cases directly proportional to the equipment and work expended.

The sampling of droplets presents problems, for droplets pass so rapidly from the host to the susceptible human that they are somewhat difficult to collect with any quantitative accuracy. Open petri dishes may be held directly in front of the host, particularly when sneezing and coughing, but the results will be so erratic that few, if any, conclusions can be drawn without a very large number of samples. Some more complicated studies have been conducted where a series of air samplers have been placed strategically about a subject while he sneezes or performs other acts which tend to produce infectious aerosol particles. However, such studies are best left to research workers for they do not fit well into routine hospital use.

Hospitals are, more commonly, concerned with the contamination of fomites and fortunately it is possible to gain an estimate of the quantity of contamination on a fomite as well as its character. The quantitation is only relative, however, and the limitations of the procedures must be kept in mind. Smooth impervious surfaces are best sampled by the use of a moistened sterile swab over an area of known dimensions. If quantitation is not of great importance as large an area as possible should be covered. If reproducibility of results is needed the area should be kept smaller, say about sixteen square inches. Flannery[1] has obtained rather consistent results in 4″ x 4″ areas by wetting a sterile cotton swab in a sterile water blank, wiping the area thoroughly, rinsing the swab in the blank, wiping the area a second time with the same swab. Accurate definition of the area is best obtained by using a sterile kraft paper mask, for each sample, with the sample area cut from the center of the mask. By using these methods it was shown that recovery of test organisms varied with the character of the surface used. Recovery was best from polished stainless steel, intermediate with porous soapstone, and least with dried white oak. The data suggest that by this method recovery was approximately 50, 36, and 12 per cent, respectively, of the organisms actually on the sampled surface, but the authors caution that this is presumptive evidence only. Nevertheless the method is of use in some investigations.

Hospitals may desire an estimate of the contamination of cloth, blankets, or linen. Probably the most satisfactory quantitative method for this purpose, although it is unpopular with hospital administrators and others responsible for the purchase of bedding, is to clip

a small measured sample out of the center of the blanket with aseptic technics, place it in normal saline, shake thoroughly, and plate aliquots of this saline suspension on agar plates. Some investigators[2] have attempted to achieve more complete recovery from a number of small samples by placing them in broth and running the samples in a blender. In either case the results can be calculated in terms of organisms per unit area.

Less destructive, and probably less accurate, is the direct use of a petri dish containing sterile solid media. The open dish is placed on the fabric, with the agar surface toward the fabric, and the dish is swept rapidly back and forth. The pressure on the dish, the length and number of strokes, and the area covered should be kept as nearly constant as possible. Results by this method should be viewed as only semi-quantitative.

The contamination of fomites bears a rough relation to the contamination of air and the degree of activity in the vicinity since the organisms on the fomites are readily resuspended in the air. To measure this route of transmission as well as droplet nuclei and similar particles moving directly from the host into the atmosphere, the contamination of the air may be sampled by any of a number of devices, some with only qualitative, some with quantitative characteristics.

It is in the field of air sampling that the most recent advances have been made. A recent publication[3] describes 37 different types of aerosol samplers. Not all of these are adaptable or recommended for hospital monitoring, and unfortunately, many were especially made for certain research studies and are not commercially available. Only a few of these samplers will be discussed, those most adaptable to hospital studies.

Much use has been made of the agar settling plate since it is inexpensive and simple in operation, but the results obtained are qualitative in nature and give little information on the quantitative concentration of air-borne bacteria. In use, the open agar plate is exposed to the atmosphere for a given time during which organisms settle on the agar surface. The number settling depends upon air currents, particle size, and density. It is considered to give a rough indication, when compared to volumetric sampler results, of the size of particles in the air, and their settling rate. This sampler provides an easy and quick method of determining the presence or absence of biological contamination and its quality; however, results can be quite variable. It has a place in hospital use, but normally only to indicate the presence or absence of species in question.

If both bacteria and viruses are of interest to the investigator, a liquid impinger can be used. This sampler is the simplest one for this purpose. Air is drawn through the sampler and organisms contained in the air are impinged in the collection fluid. Normally, samples are collected for a period of approximately ten minutes after which the liquid in the sampler is assayed by standard biological technics.

Perhaps better suited to the demands of routine hospital use are the impaction type samplers. These, however, are limited to the collection of bacteria, and not viruses. Examples of impaction samplers are sieve and slit-type samplers. The sieve sampler consists of an aluminum container that holds a standard petri dish. Air is drawn through small holes and particles are impacted on the agar surface. A limited number of sieve samplers are available from the Communicable Disease Center's Technical Development Laboratories for qualified investigations.

The Andersen sampler is shown in Figure 1. This essentially is a cascaded

Figure 1—The Andersen Sampler

arrangement of sieve samplers which have smaller diameter holes in each succeeding plate. Air passes through a series of six sieves under which are located agar dishes. This sampler has the feature of providing particle size discrimination as well as total bacterial concentration. Although the Andersen sampler is highly efficient, its use is complex in that each time a sample is collected six agar plates must be manipulated, each containing an exact quantity of media.

The liquid impingers, the sieve, and the Andersen samplers have the advantage of providing qualitative and quantitative information concerning the concentration of air-borne organisms in the environment. Liquid impingers and the Andersen sampler are commercially available. Samples from the sieve and Andersen samplers do not require any further laboratory manipulation after collection of the samples, since the organisms are impacted directly on the agar surface and after sufficient incubation the colonies can be counted directly on the plates. The liquid impinger, however, requires plating out of the sample and results are best expressed in terms of total organisms, for large particles consisting of several organisms are broken up in this sampler during collection. The data from this source represent not the number of discrete organisms found in the air but the number in the disintegrated clumps. One might expect, therefore, that if a comparison is made between the solid media impaction samplers and liquid impingers, the resulting counts would be higher with the liquid impinger. This could lead to an erroneous conclusion that the liquid impinger indicates a higher concentration of organisms in the air sampled than the other type samplers.

Another group of impaction samplers may be characterized by the time-concentration relationship they provide. The air flow rates usually are from one-half to one cubic foot per minute. Air may be sampled for periods up to eight hours depending upon the sampler selected. Many different designs might be included in this group. Most of the samplers employ a narrow slit in a metal plate through which the air passes at high velocity to impact on a solid medium surface moving at a constant rate of speed under the slit.

The Fort Detrick slit sampler, shown in Figure 2, is a cylindrical unit having as its chief components a slit tube, agar culture plate, and interval timer. A 150 x 20 mm commercially available culture plate containing agar is rotated by means of a spring-wound clock mechanism. The rate of rotation depends upon selection of a commercial timer (30 minutes to two hours). Users of these samplers have found few mechanical difficulties and have been able

Figure 2—Fort Detrick Slit Sampler

to conduct extensive studies on the variation of bacterial concentrations during surgical operations.

Another type of slit sampler is the Casella sampler which employs a metal case fitted with a glass door. The case holds the petri dish and media on a turntable rotated by a small electric motor.

The Technical Development Laboratories slit sampler, shown in Figure 3, houses the petri dish, the turntable, and the indicator in a clear plastic housing to the top of which are attached the slit tube and the indicator. The housing can be completely removed for ready access to the turntable. The indicator is mechanical and the drive can be by means of an electric or a spring wound motor. If the mechanical drive is used, all electrical connections can be avoided and the sampler will be explosion-proof.

The slit incubator sampler, Figure 4, is contained in a rectangular stainless steel box with a transparent plastic cover in the center of which is threaded an adjustable slit tube. Air and the suspended particles are impacted on the surface of the agar contained in a moving rectangular metal tray 4" x 19". The tray containing the medium is propelled under the slit at a rate of 2½ in./hr by a rotating screw, powered by an electric clock motor. After the sample is collected, the plate enters the incubator section and the incubation cycle is started. The temperature is maintained by an electrically heated tape and is regulated by a thermostat. This sampler renders an extended time concentration relationship and operates over a continuous eight-hour sampling period without attention.

Another sampler recently developed is the TDL cascade slit sampler. This sampler consists of four or five modified Casella slit samplers arranged in series. Each successive slit is decreased in area so that at each stage the sampled air is accelerated to a higher velocity. This results in a decreasing range of particle sizes being impacted on successive agar surfaces. The colony counts on the successive stages provide information for viable particle size distribution determinations. Each stage of this instrument can be removed and used separately as in individual slit sampler.

Of the slit samplers discussed the Casella, TDL, and Fort Detrick are

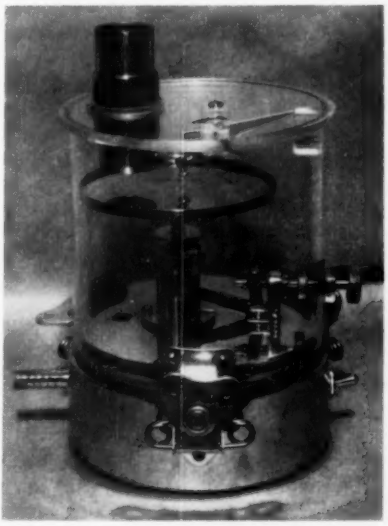

Figure 3—TDL Slit Sampler

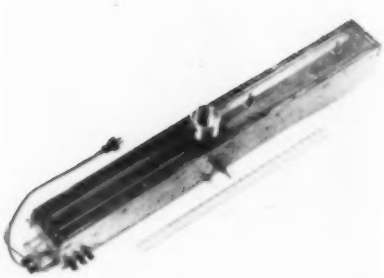

Figure 4—Fort Detrick Slit Incubator Sampler

commercially available. However, with the exception of the mechanically driven TDL slit and the Fort Detrick slit, these samplers are not designed to be explosion-proof. Therefore, they should be operated above the five-foot level in operating rooms or should be made explosion-proof by modification of their electrical components. Of all the samplers available, the slit type is probably the sampler of choice for routine hospital use. Its mechanical simplicity, the lack of manipulation of the sample after collection, and its time-concentration relationship make it particularly suitable for hospital use when the air under examination is essentially static. If high velocity air, such as is found in ventilating ducts, is to be sampled isokinetic sampling technics should be considered. Particular advantage should be taken of the time-concentration relationship of the slit-type sampler for this information can be of invaluable assistance in pinpointing a route of transmission and contributing to the epidemiology of the disease under study.

The technics described are practical and applicable. Some are qualitative but not quantitative. It is up to the investigator to determine what information is required and to select a sampler which best meets his needs.

Aside from the actual equipment, the technics for sampling air are quite simple, but considerable care must be exercised in the calibration and operation of the samplers if truly quantitative results are to be attained. Leaks in the sampler, inaccurate air flow measurements, unintentional size discrimination, and other pitfalls may trap the casual investigator and lead to erroneous conclusions. Numerous replicates and the application of statistical methods of analysis of results are desirable and frequently essential. Reference to the few publications[3,4] on this subject will prove profitable. Careful, thorough investigations using these methods can add much to our knowledge of the importance of the routes of cross-infections in hospitals and to the cutting of those routes.

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V. NURSING PROCEDURES IN THE MANAGEMENT OF STAPHYLOCOCCAL INFECTIONS

Margaret W. Thomas, R.N., M.P.H., F.A.P.H.A.

RECENTLY, the Communicable Disease Center asked Scientific Literature Consultants from Philadelphia for bibliographical data on staphylococcal infections for one month, May 15 to June 15, 1959. After a not too exhaustive search of some 2,300 scientific journals, this abstracting service came up with 53 articles published in Russia, Spain, England, France, Australia, the Scandinavian countries, and the Orient. They were written by physicians, epidemiologists, pathologists, immunologists, nurses, doctors of veterinary medicine, pharmacologists, and biologists. This is indicative of the world-wide concern with problems of staphylococcal infections and the range of professional interest in it. Furthermore, evidence of the concern of nurses is the greatly increased correspondence which has come to CDC in the past two years. More and more letters have had to do with isolation and aseptic measures, thermometer and handwashing technics, and the evaluation of disinfecting agents. The correspondents also sought information about the role of the nurse in the over-all effort to prevent and control staphylococcal infections.

Answering the letters about the overall responsibility of nursing was not difficult because we believe this to be fairly clear cut and to include:

1. Membership of nurses on the hospital's infection committee to (a) bring to the committee problems faced by nursing; (b) interpret to the nursing staff the deliberations and recommendations of the committee; (c) help plan for nursing contributions to the surveillance, reporting, and control activities; and (d) point out ways in which nursing might contribute to the total hospital educational program

2. Observing, reporting, and recording symptoms of infections in patients, self, and coworkers, as suitable

3. Development of an educational program on the problem of staphylococcal infections in general and as it relates to the specific hospital—for basic nursing students, new nursing staff, for a refresher program, for currently employed nursing staff, and for others as requested

4. Evaluation of nursing procedures

5. Compilation of up-to-date procedure manuals

6. Discipline of self and, as suitable, supervision of others in carrying out procedures that have been agreed upon.

We see no real difference in the responsibilities of hospital nurses and public health nurses except that the area of surveillance activities for the latter is the community. In the absence of close, day-by-day medical care of the patients she serves, the public health nurse must be particularly diligent in observing and reporting symptoms of infection. The nurse in industry, school, or elsewhere can make application of these responsibilities to her own job situation.

In searching for answers to the questions about aseptic technics, the nursing staff of the Epidemiology Branch of the Communicable Disease Center found that in many instances it was difficult, with integrity, to make specific recommendations. A review of existing standards often resulted in frustration because they were filled with vague references to adequate this, effective that, or suitable something else, without describing the

terms of adequacy, effectiveness, or suitability.

Typical of the vagueness of present recommendations for aseptic procedure are the following: "Personnel should change masks frequently during the hours on call and change scrub gowns and suits as indicated." This statement was found in a hospital manual on prevention of infection which, by the way, was the most thoughtful manual we have seen. Another said, "Effective and efficient masks should be worn"; and "A careful, timed and adequate pre-operative scrub of hands . . ." came from a set of national recommendations. One more example, again from a set of national recommendations: "Patients who are ambulatory must be instructed in proper technic." Nurses reading these recommended procedures will, of course, ask: "Well, what are 'effective and efficient masks'; what is a 'proper technic'; how 'frequently' should these masks be changed; and how often is it 'suitable' to change the gown or scrub suit?" In many instances, standards appeared to be carried over from old manuals to new ones or were based on the past experience of the writer. A specific example of this is the frequency with which the Standards and Recommendations for Care of Newborn Infants of the Academy of Pediatrics have been copied practically verbatim into State Health Department Hospital Regulations. This is good because the Academy of Pediatrics has provided the most specific, detailed recommendations that are available for any clinical service in the hospital. Even the academy, however, confesses that some of its recommendations are based on empirical knowledge and that further scientific investigation is needed before definitive recommendations can be made. For example, the academy does not yet feel that there is sufficient evidence to warrant a specific recommendation that hexachlorophene products be used for infants' skin care although they suggest that this be done pending further study.

The reader may wonder why all this talk about not knowing what is effective, safe, aseptic technic, for since the 1890's we have known that masks should be used to prevent the spread of infection from the nose. But let us consider a very practical question. If a nurse is giving morning care to a patient isolated because he has a bed sore which is infected with the well known 80/81 phage type staphylococcus, should she wear a mask? If a poll were taken of my readers, some would be ready to give a snap judgment and the odds are that these answers would be about 90 per cent yea and 10 per cent nay. Those who are not given to snap judgments, the real seekers after the truth, would realize that an authoritative answer to the basic question must depend on finding the answers to many subsidiary questions. The train of thought of these people might be: If the nurse does wear a mask, who is being protected from what? The nurse from the patient or the patient from the nurse? If the patient cited is a new admission to a hospital previously free of this specific strain of staphylococcus, an adequate mask might be advisable to protect the nurse on the assumption that she is not nasally colonized from previous exposure. If the patient has been in the hospital for some time it is most likely that the strain is widespread in the hospital environment and that the nurse carries or has carried the organism in her nose. If the nurse is already nasally colonized there is little point in trying to protect her from further colonization.

Going back to the nurse who is not already colonized, what is known about her likelihood of becoming colonized if she works with this patient while wearing a mask or without a mask? We know that dressings from infected wounds do give off bacteria,[1] especially if they are allowed to become moist and

are not covered with impervious materials. We know that the skin and bed clothing of infected patients will contaminate the air, particularly in the immediate environment of the bed[2,3]; but where do we find a report that nurses working with such patients are more likely to be colonized than those who are not? We know from the investigations of Lurie,[4] Abramson,[5] and Shapiro[6] that a six-ply 42 x 42 mesh gauze mask fitted securely around the noses of rabbits filtered out from 90 to 95 per cent of tuberculosis bacilli artificially seeded into the air, but who has investigated the ability of a similar mask to filter out staphylococci from naturally seeded air? Can we assume that bacteria ranging in size from 0.8 micron to 1 micron can or will be filtered out of a mask which is known to filter out organisms ranging in size from 1 to 4 microns, realizing that both of these forms of bacteria are suspended in air either on dust or droplets? And so the thoughts of these "seekers after the truth" would lead them to look further and further into investigative work trying to find specific answers to these specific questions, only to discover that such answers are not available and all one is left with is a conclusion that, to be on the safe side until further work is done, we had better use what precaution is dictated by logic. The rules for playing on the safe side in this instance include (1) wearing a mask constructed as mentioned above; (2) wearing it tied as securely as possible over both the nose and the mouth; (3) wearing it until such time as the care of the patient is completed, that is, through the removal of contaminated linen from the room and the finishing of all work in the patient's room; (4) discarding the mask immediately on leaving the room; (5) removing the gown which has been worn as part of the protective clothing; and (6) washing the hands thoroughly so that the nose which has supposedly been protected by the mask will not subsequently become infected by hands.

Since nurses writing to the Communicable Disease Center were posing such questions as those discussed above, and since the nursing staff receiving the letters were unable to supply satisfactory answers, it seemed essential to take positive action. Also, the Infectious Disease Committee of the Association of State and Territorial Health Officers at their 1958 Annual Conference had recommended cooperation between the Public Health Service and the association in "the preparation of authoritative compendiums of acceptable control techniques and the provision of epidemiologic and Public Health Nursing consultation in the presently accepted control techniques."

Faced with the responsibility for some action, we decided to start with a status survey. Our objectives were: (1) to find out what aseptic practices were currently in vogue and whether there was a thread of consistency in these practices; (2) to learn why these procedures were considered important; (3) to see whether we could establish a relationship between the diligence with which the nurse carried out the procedures and the incidence of known infection in the hospital; (4) to learn whether any studies had been made in the institutions as a basis for establishing the procedures to be used, or their effectiveness; and (5) to see how well currently recommended standards were being met.

Some of our assumptions were that the staffs of medical teaching centers comprised highly enlightened people and that one would find the best known procedures practiced there, that diligence in carrying out these procedures by all personnel would contribute to a lower incidence of infection, and that some studies would have been made which had not yet been published.

Thirteen medical teaching centers

from which to gather information were selected, taking account of geographic distribution and choosing those which were known to have infections committees, and Epidemic Intelligence Service Officers, or ex-EIS Officers of the Communicable Disease Center on their staffs.

Within the hospitals, the focus of the investigation was the obstetric-newborn area, including the formula room. An exhaustive survey of all areas of the hospital was felt to be too time-consuming. Concentration on this one clinical service, it was believed, would give a fairly typical picture of the types of procedures carried out in other parts of the hospital. Other basic services which cut across all clinical areas, such as housekeeping and laundry management, were looked into superficially in so far as they might relate to nursing practice.

Existing standards were incorporated into a worksheet, which was used to tabulate in a systematic way the information received in the hospitals as a result of discussions and observations. The standards were drawn from nationally recognized manuals and recommendations.[7-15]

The visits to the hospitals were completed in early July. The practices that were observed have been tabulated and a full report will be forthcoming in the next few months. At this point we are in position to give only general impressions.

First, the positive impressions: It seems apparent that nurses are eager for consultation and to have someone act as a sounding board for their ideas. Perhaps this is a false impression because in these visits the investigator specifically stated that consultation was not being offered. However, the rose, without being named, seemed to smell sweet. There was a missionary zeal on the part of some in striving to enforce what they believed to be protective procedures.

Hospital administrators seemed anxious to protect the patients in their institutions, even if this meant increased expenditures. There was evidence, in new construction and remodeling, of the recognition of the importance of space and equipment in the prevention and control of infections. All the infections committees had nurse members, who were not only involved in establishing control measures but in some instances were actively engaged in maintaining reporting systems.

On the other hand, the evidences of study as a basis for establishing practices were disappointing. However, there were a few. One hospital, for example, had been most scientific in determining the amount of space that would be required for rooming-in units which were to be included in new hospital construction. This hospital had employed a nurse, as research assistant to the pediatrician in charge of the nurseries, to investigate various aspects of the spread of infection. In another hospital the assistant director of nursing service had become concerned about how long equipment remained sterile after autoclaving. Although she had not written up her findings, they seemed to satisfy the hospital sufficiently that autoclaving was not repeated at as frequent intervals as was true in other hospitals.

Housekeeping departments seemed to be doing more extensive investigation than others, and blankets and detergent sanitizers were the favorite subjects for study. Sometimes nurses were, and sometimes they were not involved in these investigations.

Seeming to outweigh these positive findings were those on the negative side. Surveillance programs were not sufficiently well organized to allow for exploration of the relationship between incidence of infection and adequacy of aseptic practices.

Although it was anticipated that we would find a great deal of inconsistency in practice, this loomed even more largely than had been expected. These

inconsistencies existed between hospitals and also between services in a given hospital. One example was the length of time for re-autoclaving sterile equipment. This varied from one-week intervals to as long as from six to nine months, regardless of whether the equipment being re-sterilized was similar or not. Another example was the hand scrub technic which, in surgery, differed from that of the delivery room, although it is assumed that the same degree of asepsis is required in these two areas. The use of caps, gowns, and masks differed again between surgery and obstetrics and even between types of personnel. Sometimes the morale of personnel was low because the requirements concerning such practices as covering scrub clothes when visiting other areas of the hospital were much more stringent in one department than in another.

Not only was there little evidence of original scientific study as a basis for various practices, but there often appeared to be a lack of knowledge of the basic scientific principles involved, or of studies done by others. For example, although it is known that Zephiran and soap are incompatible, these two were used together in some instances. Misuse of masks was more frequent than proper use. There was a great deal of swabbing of various parts of the anatomy for unspecified lengths of time with solutions of unknown dilutions; and, in some institutions, the attempt to keep infections under control was carried so far as to remove from active service all nasal carriers of any type of staphylococcus.

Many practices were time-consuming and expensive, but of questionable or unproved value; among these was the scrubbing of nursery walls every two days, using pHisoHex for cleaning furniture, or re-sterilizing packs every week. In contrast to this overdoing, there seemed to be a failure to do some things which could be dictated by common sense alone, such as eliminating the use of heavy draperies at view windows in nurseries when these are known to be dust carriers and expensive to keep clean, not to mention the fact that as they are pulled back and forth they throw out a shower of dust and bacteria. The opposite of too frequent wall scrubbing was no cleaning at all above the floor, and allowing cobwebs to accumulate on high areas in such critical places as the formula room. Scrub clothes were worn unprotected to dirty areas of the hospital and without being changed or covered with a clean gown on return to the critical area. Nursery and delivery room doors often were left open when the amount of traffic outside demanded that they be closed.

There was evidence of the need to be less gullible to the wiles of super-salesmanship. With the concern over staphylococcus infection almost reaching the point of hysteria, there is a tendency to be oversold on so-called protective devices. Fortunately, no one had replaced current bassinets with a new variety claimed to be impregnated with some magic which would prevent any babies inhabiting them from becoming infected with staphylococcus.

There seemed to be a lack of concern about the time-temperature relationship in heat sterilization and the time-dilution relationship in sterilization by chemical means. A pHisoHex bath for an infant might mean the use of full strength pHisoHex to one nurse and to another the use of a few drops in a two liter basin of water. In other cases we found nurses passing out cotton pledgets soaked with alcohol or some other disinfectant to which a mother would briskly expose the tips of her fingers for a few seconds in preparation for handling her baby at feeding time.

A final observation concerns what we may call the gray area between what is considered nursing procedure and medically prescribed nursing care. With no preference to color, some of these things

seem to be either black or white. For example, a medically prescribed nursing care procedure might be the taking of temperature every four hours. The associated nursing practice in this instance is how the nurse inserts the thermometer, removes it, reads it, and cleans it. If the medical prescription is administration of a soapsuds enema, the nurse has to know how to make the soapsuds solution, fill the bag, prepare the patient both physically and emotionally, administer the enema, and clean the equipment. These are the nursing procedures which one traditionally finds in the nursing procedure manual, if such a manual exists. And these are the things which nurses have thought through and for which they have assumed a professional responsibility.

It is probably partly because of the gray area that we find ourselves in the predicament of not having specific answers for many a seemingly trifling detail. The things which come in this area are those which medicine has often prescribed but has not investigated extensively, because available time and interest logically have focused on the more scientific clinical factors in patient care. On the other hand, because nurses have looked to physicians to prescribe these things, they have not felt that they had a responsibility to investigate them. It is our contention that a nurse has a professional responsibility for such an elementary concern as her personal hygiene and that, as part of this responsibility, she should know how she can protect her clothing from her patients and her patients from her clothing. This relates to the use of gowns. She should determine a safe method for keeping her hands clean, since these are often a means of transmitting infection. She should also know whether the use of a mask as part of her regalia would be a safety device for her or for her patients. She has traditionally been responsible for the skin care of the patients to whom she ministers, yet there seems to be a fringe area centered around whether the nurse is dealing with an adult or an infant patient. No one questions that the nurse should develop the procedure for giving an adult patient a bath. However, when it comes to care of the infant's skin she waits for medical prescription. If nursing is to engage in scientific investigation of the effectiveness of its practices, the profession must first of all delineate more clearly just what the practices are. Then of its own initiative it must join hands with medicine, bacteriology, and others in setting up suitable methods of study.

Although this seems like an impressive list of negative observations, it is believed that the intra- and interhospital infection committees recommended by the American Hospital Association and others offer a means of turning the negative into a positive. Such committees, representative of the various disciplines which are concerned with hospital patient care and management, provide an opportunity for discussing and reaching an agreement about a common sense approach to righting the wrongs. The common sense approach implies reliance on basic principles of cleanliness in contrast to a multitude of elaborate practices which make the life of personnel so complicated that they are unlikely to be carried out in the long run. Such committees also plan for an organized educational program to increase the understanding of the difference between right and wrong, and, finally, having agreed upon proper action to be taken, serve as the disciplinary bodies to see that the agreed upon action is carried out.

Although the project just reported has been concerned with the nursing procedures in hospitals, the situation with regard to public health nursing is comparable. It is a well known fact that patients who acquire staphylococcal infections in hospitals or who become

colonized with staphylococci may carry the illness home or may infect other members of the family. This means that the public health nursing group must be concerned not only with observation of symptoms and reporting suspected cases but also with the safety of procedures carried out in taking care of patients at home. It has been said of hospital infections that part of the problem in their control is the laxity in aseptic practice which has accompanied the advent of antibiotics. It is quite possible that a similar laxity could be found in home care practices if these were scrutinized as carefully.

In summary, this is a brief report of a project designed to find out: (1) What consistency there is in aseptic nursing procedures currently in vogue in the maternity-newborn departments of 13 medical centers; (2) how they measure up to recommended standards; (3) the rationale—or lack of it—for employing these particular practices; and (4) whether there is any evidence that the diligence with which nurses carry out aseptic procedures influences the incidence of infection. It has been pointed out that we at CDC do not feel in a position to be dogmatic about recommending methods of aseptic nursing practice. We have made a plea for a return to the time-worn measures of the years until further scientific investigation proves or disproves the validity of their effectiveness. We have urged that nursing assume its professional obligation for participating in such investigations.

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According to this study the reported incidence of brucellosis does not give a true picture of the situation. A substantial number of cattle and hog carcasses are contaminated with brucella organisms. As a result those who work with meat and meat products, as well as the consumers are subjected to exposures resulting in an unknown incidence of unrecognized infections. The author delineates the size of the problem.

PRESENT EVIDENCE ON THE ROLE OF MEAT IN THE EPIDEMIOLOGY OF HUMAN BRUCELLOSIS

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THE LITERATURE adequately delineates the role of milk as a source of human infection; the relationship of abortion with its attendant contamination of the surroundings to human infection; the occupational hazard of the abattoir worker in slaughtering diseased animals; and such lesser hazards as milking, driving, and handling domestic animals. These well substantiated and commonly accepted means of infection undoubtedly account for the vast majority of the diagnosed frank clinical cases of "classical" brucellosis. However, there is considerable evidence that these cases of brucellosis account for very few of the total number of Brucella infections. From a perusal of the literature it seems that the disproportionate ratio of diagnosed cases to subclinical and misdiagnosed cases is recognized by the majority of the workers in this field. This diagnostic confusion is, of course, due to the fact that no truly adequate diagnostic tool has been developed to date, and the Brucella organisms in the infected individual may produce such extremely varied symptoms.

This paper presents evidence of one source of infection and its possible relationship to the complete spectrum of Brucella infection in the human being. "Meat" as used in this report will be defined as the edible portion of cattle, swine, sheep, and goat carcasses that have been refrigerated for at least 18 hours after slaughter, with or without further processing. In this attempt to assess the role of meat in the epidemiology of brucellosis the three essential components of an infection will be considered.

The Etiological Agent

The well documented role of the three species of Brucella in human brucellosis needs little comment. Numerous reports bear out the fact that the types of Brucella organisms found in human beings in a given area have roughly the same relative predominance as the animal population in that area (e.g., Br. suis and swine in Iowa and Br. abortus and cattle in northern Minnesota). It should also be borne in

mind that strain 19 of Br. abortus, which is used to vaccinate calves (over 4,600,000 in 1955),[1] is very virulent when injected into human beings. There appears to be little information as to how infectious this organism is by other routes or whether it can be found in cattle tissues at slaughter. Vaccinated animals, however, have been found to shed virulent organisms in their milk.

The Vehicle

A. Beef—The U. S. Department of Agriculture[1] reported 17,129,000 cattle officially tested for brucellosis in 1955 with a reactor incidence of 2.5 per cent; of this group of reactors 363,000 were sent to slaughter. There were 18,630,000 cattle slaughtered in federally inspected plants in 1955.[2] Since only 75 per cent of the total are so slaughtered, it is estimated that 24,000,000 adult cattle (over one year of age) were slaughtered for human consumption in the United States. If the 2.5 per cent incidence is valid, 600,000 Brucella agglutinin positive cattle were slaughtered. The 10,000,000 calves (under one year of age) will not be considered here in view of their equivocal infection rates.

Inasmuch as there are no distinguishing macroscopic lesions in Brucella infected cattle, none are condemned at post mortem for brucellosis, and all find their way into retail channels in one form or another unless condemned for some other reason. The U.S.D.A. Meat Inspection Regulations[3] state: "The udders from cows officially designated as 'Bangs disease reactor' or as 'mastitis elimination cows' shall not be utilized for edible purposes." They further require that butchers cleanse their hands and sterilize their tools after handling "diseased" carcasses. Other regulations are not applicable because of the lack of visible lesions. Although care is exercised to varying degrees in removing the mammary glands of a reactor, there is always some contamination of the carcass with milk and fluids during this operation and portions of the supramammary lymph nodes may be left on the carcass. Furthermore, there are the estimated two to three hundred thousand infected animals not recognized and not cautiously dealt with, and whose udders may be used for food.

Table 1 is a composite of four isolation studies. Two were of naturally infected and two of artificially infected cattle. Doyle[4] isolated Br. abortus from various tissue in 26 of 32 naturally infected cattle showing positive agglutination titers. In 17 cows it was isolated from tissues other than the udder and supramammary lymph nodes. He states: "The observations here recorded show that Br. abortus may be widely distributed in the bodies of naturally infected cows . . . ." "As the animals were bought at random it appears reasonable to regard the distribution of the organisms in them as a fairly true picture of its distribution in carrier cows in general." McCullough, et al.[5] isolated Br. abortus from 42 of 100 naturally infected reactor cattle routinely slaughtered. They state: "The isolation of Br. abortus from numerous sites in a significant number of the animals examined emphasizes the potential exposure to brucellosis encountered by personnel engaged in processing the carcasses of Bangs reactor cattle." Washko, et al.[6] isolated Br. abortus from tissues of nine out of 18 cattle that had been artificially infected via the conjunctiva and mammary gland, these being two of the probably "normal" routes of infection. They state: "The findings further emphasize the potential exposure to Brucella encountered by personnel handling raw meat originating from cattle infected with brucellosis. These findings are contrary to the popularly expressed opinion that localization of Br. abortus in the udder and genitalia minimize the danger of

Table 1—Distribution of Brucella Organisms in Cattle Carcasses

Tissue	References			
	Doyle[4]	McCullough[5]	Washko[6]	Washko[7]
Liver*	1/32¶	3/95	0/18	
Prescapular LN*	1/7	9/95		
Popliteal LN*	2/19		1/18	
Iliac LN*	13/23	10/99	4/18	2/8
Prefemoral LN*		7/95	2/18	4/8
Deep inguinal LN*			3/18	
Thigh muscle*			1/18	
Vertebral marrow*		0/40		
Pharyngeal LN†	7/26	8/100	5/18	
Submaxillary LN†	3/26	4/100	1/18	
Atlantal LN†		1/8		
Parotid LN†		1/100		
Mammary Gland‡	22/26			
Supramammary LN‡	16/25	28/99	3/18	6/8
Mediastinal LN§	2/24	5/93		
Bronchial LN§		8/95	2/18	1/8
Spleen§	3/32	2/99	2/18	
Hepatic LN§	1/10	6/97	1/18	1/8
Tonsils§		4/99		
Splenic LN§		6/97		
Ilio cecal LN§		5/97		
Mesenteric LN§		3/100	2/18	
Sternal marrow§		0/49	0/18	
Knee fluid§	2/3			
Bile§	1/32			
Isolations/positive serology	26/32	42/100	9/18	6/8

* Tissues routinely found in retail cuts of meat.
† Tissues routinely incorporated into hamburger.
‡ Tissues which may be used in prepared meats.
§ Tissues routinely discarded.
¶ Numerator is number of isolations; Denominator is number tested.

use of such animals for food purposes with the inherent dangers." Washko and Hutchings[7] infused the mammary glands of eight cows with Br. suis and were able to isolate the organism from tissues of six of the animals.

B. Pork—There were 56,978,000 swine slaughtered under U.S.D.A. inspection in 1955.[2] If this is 75 per cent of the total there were approximately 75,970,000 swine slaughtered for human consumption in the United States. There is no official testing program for swine, so an estimated incidence must be derived from reported surveys. McNutt[8] tested the sera of 1,547 hogs, killed routinely, and found 3 per cent to be positive. Huddleson, et al.[9] tested the sera of 3,975 hogs, routinely slaughtered, and found 7.7 per cent to be positive. If an average of 5 per cent were chosen, we assume that 3,798,500 swine with Brucella agglutinin positive sera were slaughtered in the United States in 1955.

Visible distinctive lesions of brucellosis in swine are found only in the spleen and lumbar region of the ver-

tebra. Of the estimated 3¾ million Brucella agglutinin positive swine killed in 1955, only ten were condemned for brucellosis. The remainder of these 3¾ million carcasses went into retail trade channels in varying forms unless condemned for other reasons. The U.S.D.A. Meat Inspection Regulations[3] state: "Carcasses affected with localized lesions of brucellosis may be passed for food after the affected parts are removed and condemned." Feldman and Olson[10] reported that they found spondylitis in the lumbar region of 24 out of 67,000 routinely slaughtered hogs and isolated Brucella from ten of these. McCullough, et al.[11] removed one submaxillary lymph node from each of 5,000 hogs over a period of five months and isolated ten strains of Br. abortus, 11 of Br. melitensis, and 14 of Br. suis. These 35 isolations represent an incidence of 0.7 per cent. They state: "When one considers the chance of recovering cultures from a single node of an infected animal, it is surprising that an incidence as high as this was found." And, "The regular recovery of all three species of Brucella in this study is noteworthy."

Table 2 is a composite of six studies of the distribution of Brucella organisms in the swine carcass. These involved naturally infected animals in all cases. McNutt[8] isolated the organism, species unspecified, from 12 of 34 agglutinin positive swine. Huddleson, et al.[9] re-

Table 2—Distribution of Brucella Organisms in Swine Carcasses

Tissue	References					
	McNutt[8]	Huddleson[9]	Hutchings[12]	Borts[13]	Johnson[14]	Johnson[15]
Lumbar LN*	1					
Inguinal LN*	3		5			
Rt prefem LN*			5			
Iliac LN*		7	5		2	6
Prescap LN*			1			
Loin muscle*			0			
Liver†	0	5	4		1	10
Submax LN†	3		9	3	2	2
Cervical LN†	3		4			
Suprapharyngeal LN†			2			
Supramam LN‡		6			4	11
Gastric LN‡		8			4	13
Bronchial LN‡		2	8			2
Spleen‡	3	18	5	1	11	29
Kidney‡	1	4			2	4
Hepatic LN‡	3		8	3		
Mesenteric LN‡	3	3	5			2
Unclass LN				5		
Isolations/positive serology	12/34	41/308	11/11	4/8	15/25	46/178
Isolations/negative serology	—	—	—	8/12	0/29	0/118

* Tissues routinely found in retail cuts of meat.
† Tissues routinely incorporated into sausage or other prepared products.
‡ Tissues routinely discarded.

ported that tissues in 41 of 308 agglutinin positive swine yielded cultures of Br. suis. Hutchings, et al.,[12] isolated Br. melitensis from a broad spectrum of tissues on each of 11 agglutinin positive swine. Borts, et al.[13] reported the isolation of Br. melitensis from the tissues in four of eight agglutinin positive swine and most significantly from the tissues in eight of 12 agglutinin negative swine. Johnson and Huddleson[14] reported isolation of Br. suis from a variety of tissues in 15 of 25 agglutinin positive and from none of 29 agglutinin negative swine; and later[15] reported its isolation from tissues in 46 of 178 agglutinin positive and none of 118 agglutinin negative swine.

There are certain ameliorating factors which apply to pork. Beef is commonly retailed in the green (noncured) state, whereas two-thirds to three-fourths of all pork is cured, and/or smoked, and/or cooked to varying degrees before it leaves the wholesale channels. Hutchings, et al.[12] reported an experiment in which they took hams of swine naturally infected with Br. melitensis, "artery pumped" them, as is done commercially, immersed them in curing solution for 21 days, and smoked them. They isolated viable organisms from the muscle tissue through the 17th day and from the lymph nodes through the completed 21 days of curing but were not able to isolate the organisms after smoking the hams. Present-day methods do not always include this severe a curing process. Huddleson, et al.[9] found that holding lymph glands at $-10°F$ for ten days did not reduce the numbers of viable Br. suis in naturally infected tissues, but that this time and temperature rendered liver tissue free of viable organisms. McNutt[8] in his report on the isolation of Brucella from lymph glands of swine reported that there were "usually large numbers of organisms" present. He estimated that the lymph glands contained "several hundred organisms per milligram of tissue." Huddleson, et al.[9] found from three to 60 organisms on the cut surfaces of lymph glands. Their method consisted of "smearing the cut surfaces of the tissues over the surfaces of liver-agar plates . . . ." with no mention of size of the cut surfaces.

C. Mutton—Although there were 14½ million sheep slaughtered under U.S.D.A. inspection in 1955[2] little can be said as to their being a source of brucellosis. Sheep are susceptible to Brucella infection and isolations have been made on a number of occasions; however, nothing is known as to the incidence of infection.

D. Chevon—There were 86,651 goats slaughtered under U.S.D.A. inspection in 1955.[2] This is a small number in comparison with the over-all meat consumed, but the role of goats in transmission of Br. melitensis to man through milk and contact is well known. The U.S.D.A. Meat Inspection Regulations[3] take cognizance of the danger in this statement: "Goats which have reacted to a test for brucellosis shall not be slaughtered in an official establishment." As with sheep it is impossible to estimate the incidence of infection.

The Susceptible Host

A. Incidence in the General Population—The relations of such factors as age, sex, occupation, and others to "classical" brucellosis is more than adequately documented in the literature. There is, however, an appalling paucity of information on the complete infection spectrum and the factors related thereto. Obviously unless an infection is detected in some manner, neither its incidence nor its causal factors can be deduced. The incidence of reported cases of brucellosis in California had declined from a high of 320 cases in 1944 to 48 cases in 1954.[16] This relative decline is much the same nationwide. As

pointed out by Humphrey[16] the reasons for this decline cannot be accurately determined with the data available, but several possible factors should be borne in mind. First there is an increasing use of broad spectrum antibiotics to treat the clinical syndromes of infections which brucellosis may simulate. If the patient responds to this therapy no attempt at definitive diagnosis is made in most cases. Consequently, only the more severe, troublesome infections are diagnosed and reported. The availability of these antibiotics corresponds closely to the decline in reported cases. Second, the pasteurization of dairy products has removed one of the primary sources of massive exposure. Raw milk in urban areas is now virtually unknown, although still consumed by rural populations. Third, the elimination of reactor cows from the milking herds and large-scale vaccination with strain 19 have removed an important source of infection. Fourth, the factor of current "popularity" of a disease must be considered. Practitioners as well as the public are preoccupied with the newer disease entities, tending to make them less aware of the continued importance of older entities. The very fact that pasteurization of dairy products is now almost universal has lulled the medical profession into a feeling that brucellosis is no longer a problem in urban populations.

Stoenner, et al.[17] surveyed 25,294 sera for Brucella agglutinins in the Utah V.D. laboratory and found 2.28 per cent to be positive. They calculated that there were in all probability 26 unreported infections per year to one reported "case." Spink[18] found that 20 per cent of "normal" blood donors possessed Brucella agglutinins. Magoffin, et al.[19] in surveying sera sent to the Minnesota State Health Department Laboratory, found a ratio of roughly 4 to 1 of sera positive at 1:40 to the number of reported cases in 1947.

B. Incidence Possibly Traceable to Meat Contact—Table 3 is a composite

Table 3—Evidence of Brucella Infection Among Packing House Employees

References	Damon[20]	Heathman[21]	Heathman[21]
Type of Test	Agglutination	Agglutination	Intradermal
Employment	Per cent Positive	Per cent Positive	Per cent Positive
Maintenance	8.2	1.3	38.6
Office	0.0		
Supervisors	14.2		
Tanking	33.3		
Lard	6.6		
Smoking	20.0		
Bacon cellar	0.0		
Cutting and trimming	6.1	6.4	54.4
Slaughtering	22.3	9.3	64.0
Hide cellars		12.8	70.2
Hog miscellaneous		3.8	43.0
Total	12.9	6.9	55.0
Total individuals	51/394	76/1096	610/1096

of two surveys of packing house workers. Damon, et al.[20] surveyed the sera of 394 employees for Brucella agglutination titers of at least 1:80 and report the incidence by department of employment in the plant. Heathman[21] surveyed 1,096 employees of four packing houses both serologically and by intradermal sensitivity test. Jordan[22] reported a brucellosis incidence rate of 276/100,000 in packing house workers in Iowa versus four in noncontact groups. The difference of 272 could then logically be attributable to contact with animals and their products in the slaughterhouse, assuming all other factors were equal. Heathman[21] found that 6.4 per cent of those in cutting and trimming had positive titers to Brucella and 6.9 per cent of all the employees had such titers, a ratio of roughly 1 to 1. The 272/100,000 incidence could then be taken as a probable incidence due specifically to contact with the meat during cutting and trimming.

Humphrey[16] pointed out that 12 per cent of the total Brucella isolations in California in the years from 1943 to 1952 had no animal contact and used no raw dairy products. Levine[23] reported that seven out of 17 packing house workers with acute cases of brucellosis, all of whom used only pasteurized milk products, denied any direct contact with the meat. Careful questioning brought out the fact that they had been surreptitiously eating canned pork which had been only partially precooked. Other patients admitted eating partially cooked tongue and Vienna sausage. Magoffin, et al.,[19] reported nine cases of brucellosis in individuals with no known animal contact nor use of raw milk products. One of these individuals ate raw hamburger and the authors suggest that this may be of significance in this case.

C. Routes of Infection—Hardy, et al.[24] found that 100 per cent of a group of guinea pigs could be infected through abraded skin; 82-95 per cent through unabraded shaved skin; and only 17-33 per cent by oral administration of the same number of Brucella organisms. The importance of the cutaneous route of infection is recognized by Spink[18] and numerous other authorities on the subject. He states: "Since contact is so important, all fresh abrasions and cuts on the hands of employees of meat packing plants should be cleaned and covered."

D. Infectious Dose—Carle and Larsen[25] report that of 17 guinea pigs each inoculated subcutaneously with 19 organisms of strain 39 Br. suis infection resulted in 100 per cent of the animals with a median agglutinating titer of 1:2,560 resulting six weeks after inoculation. Elberg and Henderson[26] state: "It is probable that the respiratory route of infection is little less effective than parenteral injection. By the latter route the ID_{50} (of Br. suis in guinea pigs) is roughly estimated at 5 organisms." The ID_{50} by the respiratory route was found to be 36 organisms. They reported the parenteral ID_{50} of Br. melitensis and Br. abortus in guinea pigs to be 50 and 500 organisms respectively. Elberg, et al.,[27] reported the ID_{50} of a streptomycin-dependent strain of Br. melitensis in Macaccus rhesus monkeys to be 1,300 organisms by the respiratory route and 325 subcutaneously. Working with Pithecus syrichta monkeys, Fleischner, et al.,[28] stated that ". . . it becomes evident that some monkeys may be refractory (to Br. abortus). The feeding of milk either artificially or naturally infected (with Br. abortus) produces invasion only in rare instances . . . . These facts stand in absolute contrast to the experiences of the British Commission when working with Br. melitensis. In the majority of their experiments, a single oral administration of not more than 5,000 Br. melitensis was sufficient to infect monkeys."

Discussion

The critical factors to be considered in an evaluation of the role of meat in the epidemiology of brucellosis would seem to be: (1) The incidence of contamination of meat with Brucella organisms, and the numbers of organisms likely to be present; (2) the opportunity of contact of contaminated meat by the susceptible individual, the mode of infection and the infectious dose both quantitatively and qualitatively; and (3) the recognition of the resultant infection after bringing the infectious agent into contact with the susceptible host through the medium of the vehicle. The identity of the etiological agent and the fact that it is infectious have long been established and need no comment here.

1. The Incidence of Contamination—of the beef carcass would seem to be quite significant if we accept the fact that 2.5 per cent of all carcasses slaughtered in 1955 were from animals that would show an agglutination titer—and in view of the fact that Doyle[4] isolated Brucella from 26 out of 32 reactors, and McCullough, et al.,[5] isolated the organisms from 42 out of 100 reactors, even though McNutt[8] was unable to isolate Brucella from eight reactors. If we assume that Brucella can be isolated from 50 per cent of the reactors, there is an incidence of 1.25 per cent of the beef carcasses containing viable organisms. The organisms would seem to be rather widely distributed throughout the carcass as detailed in Table 1. The first eight tissues listed in this table are routinely found in retail cuts of meat and the next four tissues may be found in hamburger. Mammary glands and supramammary lymph nodes may be used in the preparation of certain prepared meats. It is obvious to anyone familiar with the methods of dressing and cutting meat that the presence of viable organisms in one carcass poses a very real threat of contamination to subsequently processed carcasses through the media of knives, saws, cleavers, grinders, chopping blocks, and butcher's hands or gloves. Therefore, one cannot unqualifiedly accept the figure of "only" 1.25 per cent of the meat being contaminated.

The incidence of contamination of pork is not readily evident from the available information. Totaling the six surveys listed in Table 2 we find isolations from 129 out of 564 agglutinin positive swine or 23 per cent. If this figure is combined with the 5 per cent incidence of positive agglutinins in the random population, it is evident that at least 1.15 per cent of the swine carcasses contain Brucella organisms. The only large-scale random survey of pork is that of McCullough, et al.,[11] in which they isolated Brucella from one submaxillary lymph node in 0.7 per cent of 5,000 swine. Comparing the submaxillary to the total isolations in five surveys listed in Table 2 we find a relationship of 19/96 or 1/5. Application of this factor of 5 to the 0.7 per cent suggests that this survey of 5,000 swine might have been expected to reveal an incidence of 3.5 per cent if a wide spectrum of tissues had been examined. The statements by Hutchings, et al.[12]: "Even in culturing a known infected lymph node, one may not always recover the organism. [This is probably due to] an unequal distribution of organisms through the node and failure to section an infected area in sampling"; and the report by Borts, et al.,[13] of the isolation of Brucella organisms from eight of 12 serologically negative swine further suggest that the true incidence of contamination may well be on the order of the larger figure. As with beef there is a widespread distribution throughout the carcass, as detailed in Table 2. The first six tissues listed are routinely found in retail cuts of meat, while the next

four as well as any of the first six may be found in sausage or prepared meats. The ameliorating factors of curing, and/or smoking, and/or cooking a large portion of pork products before they are placed in retail channels must be considered in attempting to assess the over-all incidence of contamination at all levels of human contact. Bacon is both cured and smoked; hams are generally cured and smoked though numbers are sold green; and loins and shoulders are generally sold green though they may also be smoked. The remainder of the carcass finds its way into sausage, both green and smoked, and various forms of luncheon meats which are generally cooked. The U.S.D.A. Meat Inspection Regulations[3] state: "Products (other than those normally thoroughly cooked prior to eating)—containing pork muscle tissue —shall be effectively heated (to 137°F), refrigerated or cured—to destroy—trichinae—." The resultant effect upon contaminating Brucella is equivocal. However, most of these products have been cured (from three to 14 days in salt or in brine) prior to smoking and the smaller products such as weiners and others although not cured are heated routinely to much higher temperatures. Available information suggests that Brucella would in all probability be inactivated by the pickling and smoking processes combined.

2. The Opportunity of Contact—of contaminated meat by susceptible individuals is modified by numerous factors. The group in most intimate contact with meat are of course those people employed in the cutting, trimming, and boning of carcasses and in sausage making. These people are literally "steeped" in the fat, blood, bone, bone dust, and other materials during the processing of the meat, and quite often they have abrasions on their hands. One would have to observe the several types of operations to fully appreciate the opportunity for contact with contaminated tissues. The next group in order of relative contact would be the local butchers who also may have cuts on their hands, may get bone dust in their face, or may taste the seasoned sausage. A third group comprises the housewives who handle the steak or roast, pound the steak on the chopping board (later chopping salad here too), pat out the sausage and make meat pies or dressings, tasting them for flavor. The chef in a large restaurant has much the same contact as the housewife, although much more frequently. There are also the individuals who eat improperly cooked meat or meat products and the innumerable people concerned in wrapping and delivering meats of all forms. The importance of the cutaneous route of infection as pointed out by Hardy, et al.,[24] is quite generally recognized.

McNutt[9] "estimated" that infected lymph nodes contained "several hundred organisms per milligram of tissue." Huddleson, et al.,[8] reported relatively large numbers of organisms on cut surfaces indicating the presence of a considerable number of organisms in the whole lymph node. If McNutt's estimate is accurate, a few lymph glands could readily seed ground meats with organisms. However, the fact that the Brucella organisms show a predilection for lymphoid tissue and the relative volume of lymphoid to muscle tissue would introduce a dilution factor into this seeding process. Whether the human infectious dose is in any degree comparable to that of the guinea pig or to that of the different species of monkeys must remain a matter of speculation until human volunteers are available for experimentation. This very fact of uncertainty necessitates the assumption (from a public health standpoint) that minute doses are potentially infective.

3. The Resultant Infection—Brucellosis presents a particularly difficult problem to the epidemiologist because

of the confused relationship of symptomatology to infection per se. If only one infection in 26 or even one in five is recognized, then the epidemiological studies that take cognizance of the proved cases only are of limited value. The literature is filled with reports of asymptomatic brucellosis, "normal" individuals with Brucella agglutinins, and isolation of Brucella from "normal" individuals. Until better methods of detecting infection are developed, one is forced to qualify all findings relative to incidence of brucellosis in any population. Minimal doses of Brucella organisms, such as one would expect to find in meat, may well cause infections of such a low grade as to be unrecognized or misdiagnosed. These minimal, repeated doses might well trigger allergic-type phenomena, the causes of which are not presently recognized. There are numerous reports in the literature implying the existence of this type of phenomena in Brucella infections.

By a combination of Jordan's[22] and Heathman's[21] findings, a hypothetical figure for the incidence of brucellosis directly attributable to contact with meat was derived. No one reported study is sufficiently detailed to derive this type of information from it alone. There are obvious pitfalls in this type of hypothetical estimation. Jordan does not report the status of his population as to raw milk usage, but Heathman reports that 89 per cent of the workers in her study used pasteurized milk exclusively. The 272/100,000 incidence attributable to meat contact is most certainly a significant figure and, it should be emphasized, is based on diagnosed clinical cases only. The application of Stoenner's factor of 26 or even Maggofin's factor of five would raise this to an extremely significant figure. Humphrey's report[16] that 12 per cent of culturally proved cases of brucellosis in California had neither animal nor raw milk contact suggests that the urban population is now being exposed by routes as yet unrecognized.

Conclusions

1. Available evidence indicates that at least 1.25 per cent of the cattle carcasses and 1.15-3.5 per cent of the swine carcasses processed for meat are contaminated with one or more of the three species of Brucella organisms in varying numbers; and as a result the processors, butchers, delivery men, and others are open to repeated and often massive exposure with a resultant high incidence of recognized infection and an unknown incidence of unrecognized infections.

2. A substantial proportion of the retail supply of meat and meat products is contaminated to varying degrees with one or more of the three species of Brucella organisms. As a result housewives, chefs, retailers and persons eating rare meat are subjected to potential exposure of undetermined frequency and magnitude resulting in an unknown incidence of recognized and unrecognized infection.

3. Reported incidence of brucellosis is not a true index of the actual incidence of infection among the human population.

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Sanitary Engineering in Delft

An 11-month European Course in Sanitary Engineering will be given from October, 1960, to September, 1961, at the Technological University at Delft, Netherlands, with Netherlands Universities Foundation for International Cooperation as co-sponsor. The Organization for European Economic Cooperation and the World Health Organization are supporting the project, the OEEC offering to pay half the expenses incurred by participants coming from its member countries. The course will be limited to approximately twenty participants and will have as its objective the training of civil engineers in sanitary engineering. The faculty experts from different European countries will be headed by W. F. J. M. Krul, professor of sanitary engineering, Technological University, Delft. Instructions will be in English. Tuition is 2,000 Dutch guilders. Closing date for applications: July 31, 1960. Further information from NUFFIC, 27, Molenstraat, The Hague, The Netherlands.

Earlier enthusiasms and rejections in health education are being reevaluated in the light of scientific research. In this context a study of the place of the mass media is necessary, and the following paper deals with this question.

THE ROLE OF MASS MEDIA IN PUBLIC HEALTH

William Griffiths, Ph.D., F.A.P.H.A., and Andie L. Knutson, Ph.D., F.A.P.H.A.

MASS MEDIA are intensively employed in public health. Vast sums are spent annually for materials and salaries that have gone into the production and distribution of booklets, pamphlets, exhibits, newspaper articles, and radio and television programs. These media are employed at all levels of public health in the hope that three effects might occur: the learning of correct health information, the changing of health attitudes and values, and the establishment of new health behavior.

During the past decade there have been strong disagreements among public health leaders regarding the effectiveness of mass media in achieving these ends. In one camp are those who believe that mass media are highly effective and deserve recognition as the primary means of public health education. Opposed are those who strongly question such a point of view, and argue that health education must use more dynamic methods. Some educators go so far as to assign mass media a relatively limited role.

Those who support the wide use of mass media maintain that mass media provide the best means of imparting the latest scientific information to large groups of people. It has been the experience of health workers that the general public possesses a great deal of incorrect information about traditional health problems and at the same time lacks an understanding of the advances in numerous public health fields. The mass media are assumed to be the means whereby changes in knowledge can be achieved. The correct information is supposed to produce a trigger-like reaction whereby new health facts lead to a change in health attitudes and values, which in turn bring about changes in health practices. This assumption is based partly on the observation that industry spends considerable sums of money for advertising through mass media, and would not do so unless results were achieved.

Others feel that even the best of mass media will not reach members of these groups which most need the services public health has to offer. Some more personalized approach would seem necessary both to reach such groups and to influence the values, beliefs, and attitudes which bind them to outmoded health behaviors. Furthermore, selling health is different from selling cigarettes or soaps. A business may be successful if only a small percentage of the public is influenced to become customers, and for many firms this means making only a single purchase. What a far cry this is from influencing the vast majority of our population to follow a particular health practice day after day for the rest of their lives.

The two sets of arguments seem poles apart, yet each has a ring of truth. They pose for us a most serious question to consider: What is the role of mass media in public health programs?

In approaching this question we are fortunate that a wealth of excellent research evidence is available. Since the beginning of World War II mass communications have been the subject of intensive research, and many excellent studies have been reported. It is the purpose of this paper to review some of the most significant of these studies in so far as they have a bearing on our question.

Mass Media Tend to Reach Select Audiences

There is ample evidence, and certainly no reason for presenting details, to show that the mass media in this country reach millions of people, yet they are more likely to reach persons of somewhat better socioeconomic status, educational status, and those more active in the community activities than those of lowest socioeconomic status, education, and participation in community affairs. They are somewhat more likely to reach the persons in leadership positions than those in followership positions, those who have prestige and status in their intimate groups rather than those who lack these characteristics.

This conclusion is supported by a wealth of interesting data pertaining to the number of people reached by the various media.[9,10,13] It even applies with respect to the use of the public library.[1]

The major concern, of course, is not one of reaching people but rather of reaching the desired audience. A pamphlet intended to recruit young girls into the nursing profession has no chance of achieving its purpose unless the pamphlet is read either by those individuals eligible to enter the nursing profession or by others who will communicate the contents to the eligible group. In many cases, when we can define precisely the desired audience, it is possible to devise ways of reaching the group through mass media. On the other hand, certain desired audiences, such as men between the ages of 50 and 60 with cardiac disorders, or the 15 per cent of the population which was not reached in the county x-ray survey, are sometimes nearly impossible to reach by means of mass media alone.

At times it is necessary to reach every citizen in the community. It may be important for everyone to take action regarding an impending epidemic, or to take essential health precautions during a period of crisis or disaster. The success of some major health effort may depend on the participation of groups that cannot be reached directly through mass media channels.

Most health workers are only too familiar with the fact that such groups as the PTA are attended by the parents who least need to be reached. The parents who would most benefit from the health talk or movie are rarely in attendance. The audience is free to select or reject.

Even when people are exposed to a communication, they may neither read nor listen to what we have to say. During one of the war bond drives in World War II every household in Baltimore, Md., received a pamphlet urging the occupants to buy bonds. After a short period of time a large number of people was interviewed, 83 per cent of whom did not recall receiving a pamphlet.[3]

People read, listen to, or see primarily those things with which they agree. During World War II every possible communication channel was used to persuade people in a certain community to see a particular movie, the purpose of which was to heighten citizens' identification with the war effort. Only 5 per cent of the adults in the community attended the movie. When those persons

who attended the movie and those who did not attend were interviewed, it was found that the former group had already manifested more behavior encouraged by the movie than the latter group. For example, 40 per cent of those who attended the movie had given blood to the Red Cross prior to attending the movie compared to 20 per cent of those not attending.[3]

Klapper, in commenting on the large number of researches on this process that he calls "self-selection," writes: "Whether a person voluntarily reads at all, what kind of material he reads, what kind he listens to, and what type of movie he chooses to see are apparently determined by his cultural status. Taste, in the widest sense of the term, seems a product of formal education rather than of attendance on given kinds of mass media material. Tastes, indeed, seem so fixed that mass media have little chance to do anything about them. For it now appears that a given kind of material distributed through the mass media, reaches only those persons who already like such material." [9, pp. Intro., p. 11]

Effects May Be Specific and Limited

If we can reach and hold our desired audience, how effective will mass media be in imparting the intended message? One of the most careful and intensive research investigations in mass communication was conducted in World War II and we believe it is significant enough to report in some detail. Hovland and his associates,[6] working in the War Department's Information and Education Division, investigated the effectiveness of numerous training films, including the "Why We Fight" series. This series consisted of seven 50-minute films, used especially in orienting new recruits during basic training. The films outlined the history of World War II from the rise of Fascism in Italy and Germany through America's entrance into the war. As to the general purpose of the films, Hovland states: ". . . their purpose was not purely instructional in the manner of a training film, but was rather to get across particular interpretations of facts, overcome prejudices, arouse motivations and in general to modify attitudes rather than merely to convey factual information." [6, p. 21]

Two basic assumptions were made in preparing the "Why We Fight" series. First, that a large group of men entering the Army lacked knowledge of the world events leading to America's entrance into the war. Second, that if the men understood the facts of the situation they would accept their role in the Army more readily.

Without describing in detail the experimental design and procedure of the research, it will be of value to know that for a number of the films experimental and control groups were devised; in the former were men who had seen the films while the control group consisted of men who had not seen the films. The films were pretested through interviews and questionnaires and the same methods were used in securing information after the films had been seen. The major findings of this research make a real contribution to understanding the effects of mass media.

First, the films were found in general to be quite effective in imparting factual information. Men who had seen the films increased considerably their knowledge about the war and knew much more about various national and international events than the men who had not seen the films.

Second, the films were effective in changing opinions when the opinions dealt with specific facts covered in the films. For example, a greater number of men who had seen the film "Prelude to War," as compared to those who had not seen it, agreed with the statement that the German Army had about the best trained officers in the world. Al-

though the films were effective in changing opinions, changes in opinions were not as great as changes in information.

Third, in analyzing the films in relation to motivation, Hovland writes: "The films had no effects on the items prepared for the purpose of measuring effects on the men's motivation to serve as soldiers, which was considered the ultimate objective of the orientation program." [6, pp. 64–65]

A similar method of analysis was used in the study of the reaction to a mass x-ray survey conducted with strong mass media support in Mishawaka, Ind., in 1947 and 1948. Random adult samples of approximately 400 were obtained prior to and after the intensive information campaign lasting almost a year.

"In general, the study indicates that the survey was effective in imparting specific information publicized in the survey, and was successful in motivating a little over 60 per cent of the adult population to obtain x-rays during the year. The findings suggest, however, that people were not always left with a thorough understanding of the items of information they had picked up; that the survey failed to increase knowledge or influence attitudes in areas of information and attitude not specifically covered in the survey; and that it was unsuccessful in influencing some of the basic attitudes related to tuberculosis control."[7]

Schram,[14] in an evaluative review of the effects of mass media, concludes that mass media are valuable in increasing factual information and changing attitudes when the media are highly specific. He believes that ". . . the amount of attitude and opinion change tends to be proportional to the specific quality of the attitude or opinion. If the desired response is specific, it is more likely to be learned than if it is general. . . . It appears that few persons can be counted on to learn the unstated implications of a mass communication." [14, p. 405]

In the health field, Greenberg and his associates[4] have attempted to determine whether the pamphlets "Pierre the Pelican" met the objectives for which they were written. This series of pamphlets distributed widely by health agencies and intended for parents of first-born children was designed to motivate parents to use certain child-rearing practices. The series consisted of 12 pamphlets, simply and attractively designed, each dealing with various areas of child growth and development. Once a month, for the first year, a pamphlet would be mailed to the parents.

Greenberg set up experimental and control groups of parents of first-born children, based on four strata according to degree of urbanization. The experimental group received the pamphlet series while the control group did not. A questionnaire-interview schedule was developed and tested in pilot studies. Skilled interviewers were selected and underwent a three-day training course. Through the interviews, information was secured in various areas of child care and training: eating, sleeping, and toilet habits; linguistic and motor development; social development; and parents' present attitudes and future plans in relation to the child's growth and development.

Preliminary analysis of the data obtained reveal few differences in parents' feeding practices existing between the group receiving the "Pierre the Pelican" series and those not receiving it. The authors conclude with the statement: "This evaluation shows that in order to affect attitudes and practices, more must be known about how to utilize the complex psychological factors which stimulate persons to action. Also, the alteration of established patterns of behavior may be too much to expect from a single instrument." [4, p. 1155]

We may summarize with reference to the health field. If mass media are skillfully prepared, we may expect health

facts to be learned. An attitude toward a health subject may be altered quite easily if the attitude is neutral in character and the subject matter of the mass media relates specifically to the health attitude. It is very difficult, however, for mass media to change attitudes imbedded in tradition and strongly held.

Many health workers have been enthusiastic about the importance of using mass media technics because of the success of mass media in the advertising field. Lazarsfeld and Merton show the fallacy of this deduction. They write: "Prevailing beliefs in the enormous power of mass communications appear to stem from successful cases of monopolistic propaganda or from advertising. But the leap from the efficacy of propaganda aimed at deep-rooted attitudes and ego-involved behavior is as unwarranted as it is dangerous. Advertising is typically directed toward the canalizing of preexisting behavior patterns or attitudes. It seldom seeks to instill new attitudes or to create significantly new behavior patterns." [11, p. 334]

Thus, cigarette advertisers do not spend their money on attempting to convince the nonsmoker to smoke, but rather on attempting to persuade the smoker to switch his brand. The behavior change mechanism involved in this is quite different from the behavior change mechanism involved in persuading longshoremen to visit a physician at regular intervals, when longshoremen view doctors as persons you visit only when you are seriously ill.

Wiebe[15] feels that radio and television can sell citizenship objectives as well as soap provided certain specific conditions exist—conditions which have been found essential in the successful merchandising of commodities. These conditions are not easily met. One important condition of selling a commodity is having a retail outlet. Retail sales people play an important facilitating role, for they supply the link between the radio and television advertisement and the completion of the purchasing act. Retail sales clerks, often located in the nearby neighborhood, have the advertised commodity ready and attractively packaged for immediate distribution. In the field of public health, health agencies might be thought of as retail stores and health workers as sales clerks who are enthusiastic about their products and eagerly await the general public. Unfortunately, however, health agencies have very few products in attractive, easy-to-carry packages for quick and immediate delivery. The process of achieving the objective is much slower and more complex.

Personal Appeals May Influence Effects

While mass media cannot, except under most extraordinary conditions, be expected to move people to action if the action is in opposition to strong beliefs and attitudes, they can be effective in moving people to action if the desired course of action is in the direction of basic personal and social motives, and particularly if the action is supported by leaders holding acceptance and prestige in the eyes of the laymen. It is important that these leaders have the capacity to translate the action meaningfully into the behavior patterns of those concerned.

One amazingly successful demonstration of the effectiveness of mass media as a motivating force was that of Kate Smith in one of her war bond appeals. In one day, through the medium of radio, she received pledges amounting to thirty-nine million dollars. Merton,[12] in analyzing this particular radio program, studied the types of motivating themes used by Kate Smith in her appeals. Previous war bond drives had emphasized the themes of sound investment and future security, but these were entirely omitted in the Smith program. Almost one-half of her themes related to sacrifice and another third to participa-

tion and competition. These themes are illustrated in the following statements taken from her talks:

"Could you say to Mrs. Viola Buckley . . . Mrs. Viola Buckley whose son Donald was killed in action . . . that you are doing everything you can to shorten the war . . . that you are backing up her son to the limit of your abilities?" [12, p. 52]

"We can do it together. . . . We can put this greatest of war bond drives across." [12, p. 55]

"I was a little disappointed to discover that the good old town of New York was behind Los Angeles . . . now we're going to hold the switchboard open to give New Yorkers a chance to catch up to and surpass Los Angeles. Are you with me?" [12, p. 65]

Although the Kate Smith program is in no way comparable to health programs, it does illustrate the point that health programs attempting to bring about some change in behavior must give attention to the motivational factors employed. Professional health workers might not be very enthusiastic about heavy emphasis upon sentimental themes, but they must realize that formal and scientific presentations will do little towards changing behavior.

It is important to recognize that Kate Smith's success did not stem solely from her ability to communicate effectively with the public and from the fact that she held unusual prestige in the eyes of laymen. The campaign which she touched off was the result of months of planning. Many persons who intended to purchase bonds held up their purchases to take advantage of the publicity in support of the program under way. Weeks of intensive work with leadership groups intermediary between the broadcast station and the lay public were involved in developing this project. Their efforts were timed with great care in order that a bandwagon type of appeal might be developed. Unfortunately, data are not available on the amount of funds spent for war bonds resulting from the pre-planning and those which resulted directly from the appeal of Miss Smith. One must be cautious, therefore, in estimating the effectiveness of her drive even though the evidence suggests that her appeal was most potent.

Psychological Set Influences Interpretation

When unusual conditions of psychological readiness exist the mass medium may play an exceptional, and in fact frightening, role in influencing public action. This is well illustrated by the panic created by the broadcast of Orson Welles's now famous "Invasion from Mars" play in 1938. Cantril, in his study of the panic, observed that "long before the broadcast had ended people all over the United States were praying, crying, fleeing frantically to escape death from the Martians. Some ran to their loved ones, others telephoned farewells or warnings, hurried to inform neighbors, sought information from newspapers or radio stations, summoned ambulances and police cars. At least six million people heard the broadcast. At least a millon of them were frightened or disturbed." [2, pp. 291–292]

Cantril's study suggests that while no single personality variable consistently related to the panic reaction, a lack of critical ability seemed most conducive to fear under the stress situation. His study suggests that an insecure and bewildered people under pressure of domestic insecurity and international tension, lacking adequate information or appropriate standards for judging the events, and threatened by a situation in which they stood to lose all their values at once, were triggered into panic.

The credibility of persons interviewed with respect to the experts cited on the program, and the fumbling attempts of many to obtain advice from experts of their own choosing, call attention again to the importance of prestige suggestion in influencing behavior through any means of communication. Hovland and

his associates, on the basis of many studies of source credibility, conclude that "the characterization of the communicator as trustworthy or biased has relatively little effect on the learning of factual material, but markedly influences the degree to which the communicators' conclusions and recommendations are accepted." [5, p. 1072]

Trusted Informal Leaders Can Serve Key Function

The evidence suggests that achieving long-term attitude and behavior change requires communications of a more personal type to assure full understanding of the meaning of the change and to help in translating the change into the personal behavior of the individual concerned.

Other things being equal, communication is likely to be more effective if the person communicating is perceived as one who can be trusted, who is an expert, or who holds prestige in our eyes. A very popular and trusted health science writer may be more effective in communicating scientific opinions than a great scientist who lacks status in the eyes of the public. Local health leaders may be better able to capture opinion than national leaders of greater stature who lack experience in the local area. The unrecognized leader in the local group may be more effective than either of the former with the group by whom he is trusted.

It is with this informal leader that the group may be able to test out new ideas verbally or in action before trying them out in life. The discussion with him may provide an opportunity to test reality in a nonthreatening situation. It may afford also an opportunity to determine the relation of the change to the solution of the problem of concern. When this happens the person who is ego-involved in the problem may be better able to understand how it applies to him, and therefore may be more willing to adopt the new practice.

Many of the group discussion-decision studies point to the importance of this more personal type of education as a means of providing people with a better opportunity to exchange ideas and make decisions for themselves. Workshops, buzz groups, self-surveys, are all means of reality testing which help individuals to achieve change with a minimum of personal threat. In these interpersonal situations communication is more truly a two-way process. It is in this setting that the communicator can better adapt to the needs and concerns of his audience, and can better adjust to discussion in terms of the expectations or motivations of those he is seeking to influence.

Tinker to Evers to Chance?

In what ways, then, do mass media really influence patterns of personal change? Mass media do serve a significant function in providing information and support to selected groups of the population. Often, however, they do not reach those populations with which public health is primarily concerned. When they do reach those groups, the effects have been less satisfactory than might be desired.

Research suggests that mass media have varying and often limited effects, both by failing to reach all members of the population, and because the selective nature of communication does not assure adequate exposure and reenforcement. Therefore, significant behavioral changes may not result. Among those most frequently reached, however, are persons of somewhat greater than average education and of somewhat better than average socioeconomic status. These are people who tend to be active participants in informal social webs of their communities; because of their superior education and better orientation to current affairs they are more likely to un-

derstand and accept new scientific information. They are more likely also to recognize their own community's stake in new public health approaches and to see the value of action both for themselves and on the part of those less alert and less informed.

Is it possible that these persons are key communications gatekeepers to the people of their communities? One is reminded of the famous Chicago double play team of Tinker to Evers to Chance. Are these leaders the community "Evers" who receive and evaluate communications from the mass media sources, and are in a position to selectively pass on the communications to persons who look to them for leadership?

Katz and Lazarsfeld[8] have found that such an interrelationship between mass media sources and the interpersonal networks of communication in local areas does actually exist. In their investigations they have identified certain individuals whom they call "opinion leaders" who are more influential than other members of the population in their local settings. The opinion leaders they have identified are not status people in any formal way, rather they are the everyday type of person found in all socioeconomic groups, to whom people ask questions and to whom people listen. The research suggested that there is, indeed, a "two-step flow of communication" from the sources of mass media to these informal opinion leaders, and from these opinion leaders to persons they meet in everyday social contacts.

The significance of the Katz and Lazarsfeld investigation, as compared with some of the earlier studies in mass communication, is that the audience is perceived not as a mass of disconnected individuals, but rather as individuals who belong to groups and whose beliefs and attitudes are influenced by these groups. These are individuals also who share the values and beliefs of groups to which they belong and are better able than outsiders to communicate effectively with members of these groups.

As Katz and Lazarsfeld suggest, there may be a hidden network of these informal opinion leaders who are themselves affected by communications received through the mass media and who in turn influence others about them. To the extent that this is true, the role of mass media in public health education may be quite different from the role we frequently assign it. It is a potent role, and a most significant one for health educators to consider; one, in fact, that none can afford to ignore.

Research is needed to learn what different types of informal leaders exist in areas of concern to public health. Are there opinion leaders who are key communication gatekeepers in child health, in chronic diseases, in alcoholism? If so, how can the mass media be employed in such a way that these opinion leaders are more effectively utilized in the communication networks they informally serve? How can we best give "Evers" the backing he deserves?

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Worth Repeating

"A crash attack on the major problems of health suits our impatient culture. But those who might be commissioned to do the research know that it is poor strategy. At present we are more limited by the state of general scientific knowledge than by want of specific instruments or difficulties in engineering . . . . Historically the methods of uncommitted wondering has been the source of major ideas. From the confusion of detail general principles emerge—not because they are summoned for some crash program but because they are already latent in the facts that are available . . . . Obviously we, in various specialties, and the public at large have a common interest in seeing that a substantial base of scholarship is supported in its own right and not as an instrument in achieving some popular goal . . . . It may indeed be proven by history that ignorance and folly, were greater evils than cholesterol or cancer."

(From "On Crash Programs," an editorial by Vincent P. Dole, M.D., in Circulation Research, an official Journal of the American Heart Association.)

A diabetes screening center is described where about 6,000 persons are tested annually. The center was established through the joint action of a County Medical Society, a local Health Department, and a County Health Association. Operation of the center, methods used, follow-up and characteristics of persons with positive results are discussed.

A DIABETES CASE-FINDING PROGRAM

Malcolm A. Bouton, M.D., M.P.H., F.A.P.H.A., and Joseph B. Cortesi, M.D.

THE SCHENECTADY DIABETES PROGRAM was initiated by the County Medical Society rather than the Health Department. The chairman of the Diabetes Committee of the County Society approached the Health Department for help and advice in the organization of a Diabetes Detection Clinic to be held during Diabetes Week in November, 1953. Conversations led to the decision to purchase a clinitron and to institute a Diabetes Screening Center which would be inaugurated during Diabetes Week and which thereafter would operate continuously on a year-round basis.

An unsuccessful attempt was made to secure the necessary funds for the initiation of the project from the city government through the Health Department budget. At this point the Schenectady County Tuberculosis and Health Association became interested and offered to defray the costs. As a result of these united interests a Diabetes Screening Center was established in the fall of 1953 in the City Hall, in conjunction with a preexisting Chest X-ray Clinic. The center was under the joint sponsorship of the County Medical Society, the Tuberculosis and Health Association, and the City Health Department. The Tuberculosis and Health Association purchased the clinitron and pays the salary of the technician, while the Health Department furnishes the quarters (including heat, light, janitorial service, and so forth) and pays for all expendable supplies.

The opening of the center during Diabetes Week in November, 1953, was attended with a great deal of publicity. During that week a total of 2,335 persons were screened, of whom 21 were found to have abnormally elevated blood sugars. Nine of the 21 were proved to be new cases of diabetes, i.e., not previously known to have the disease.

The clinitron, when operating at maximum capacity, will test 120 specimens per hour. Under these circumstances the machine should be tended by about ten persons in order to obviate long queues of dissatisfied customers. The staff, all voluntary during that week, consisted of four technicians who drew blood, two clerks making out record cards, one person reading and recording the test results, one person operating the clinitron, one hostess, and one test tube and pipette washer. Also, it was considered wise to have a physician in

constant attendance or immediately available. After the "kick off" during Diabetes Week, the clinitron was operated in conjunction with the Chest X-ray Clinic on a year-round basis, with the center open five days and one evening a week. The screening center is conveniently located near the downtown business section and the tests are free to all who walk in and request them. A "Case-Finding Committee" of the Schenectady County Health Association was fairly active from April 27, 1954, until December 10, 1956, stimulating interest among groups such as members of granges, food handlers, staffs of small industries, and the like. Periodic newspaper and radio releases publicizing the center were necessary during the first few years of operation; thereafter its existence became well known, and it has enjoyed a steady patronage averaging around 6,000 persons annually.

Method of Operation

There are no restrictions regarding eligibility for testing, except that persons under 15 years of age and known diabetics are discouraged from taking the screening test. Also, the specimens were postprandial during the period covered by this paper, that is the individual must have eaten within 2½ hours—later, in January, 1958, we lowered this to 1½ hours. Frequently known diabetics are referred to the center by family physicians, who do not understand the exact nature of the test. In such instances the physician is called and advised that the center is not running a quantitative analysis, which can be obtained only at the hospital laboratory. If, knowing its limitations, the physician still wishes the test run, this is done.

During Diabetes Week of 1953, no inquiry was made concerning the time since last meal as it was considered an impractical procedure when large numbers of people were being tested rapidly. In retrospect, however, we believe it could have and probably should have been done. As a matter of fact the hour of last meal was not taken into account at all until July, 1954, when the 2½ hour postprandial period was instituted. Since January, 1958, if the person has not eaten within 1½ hours, he is asked to return another time; a printed sheet with the following three suggested meals is given those who have to return:

If you have the test after breakfast, eat at least:
2 slices of toast or rolls
1 glass of orange juice or 4 prunes or 1 banana
1 serving breakfast food such as oatmeal or cornflakes
Coffee or tea with sugar or 1 glass milk

If you have the test after lunch, eat at least:
2 sandwiches
1 serving fruit, cake, pie, or any other dessert
Coffee or tea with sugar or 1 glass milk

If you have the test after dinner, eat at least:
1 serving each of meat, potato, and vegetable
2 slices bread or rolls
1 serving fruit, cake, pie, or any other dessert
Coffee or tea with sugar or 1 glass milk

The Wilkerson-Heftman screening method for blood sugar is used in the operation of the clinitron. All of the reagents are tablets and in our center indicator tablets are used, which screen at 180 mgm per cent when 0.1 ml of capillary blood is drawn. However, at the 180 mgm per cent level, sensitivity is lost and too many of the milder cases will be missed. This objection is overcome by calibrating the capillary pipettes at 0.1125 ml, which means about 12.5 per cent more blood volume is being drawn. This additional blood volume, in effect, lowers the screening level to approximately 160 mgm per cent so that the equivocal zone between 160 and 180 mgm per cent is covered.

In other words we are actually screening at 160 mgm per cent; to go lower on postprandial specimens would cause a loss of specificity and too many false positives.

The 0.1125 ml blood sample is mixed with 5 ml of distilled water in a pyrex test tube and refrigerated at 38°-45°F until running time. The clinitron is run twice each day, about noon and again late in the afternoon. A knife point, not accurately measured, of sodium fluoride was added to each gallon of distilled water in order to prevent glycolysis;* under these conditions there is no appreciable loss of glucose because the specimens are held for a few hours. Specimens standing at room temperature with no preservative added often undergo rapid glycolysis; this is especially true in the case of nondiabetic individuals who have a high blood enzyme content. Incidentally, two samples are taken from the same skin puncture on each person, which obviates a return visit in case of breakage, spillage, or technical failure.

It should be pointed out that the clinitron, a rather expensive machine, is actually not necessary unless large numbers of tests are made. When only a few specimens are involved, the tablets can be dropped in by hand; one needs only a heating unit and water bath.

Data Regarding Negatives

The person's name and address along with that of his physician are written upon a punch card, all other desired data are punched, i.e., age, weight, weight history, height, history of diabetes in the family, reason for visit, occupation, time of visit, time since last meal. Some of the more pertinent of these data appear in the following tables:

Individuals with negative results are sent postal cards, which advise them of the fact and at the same time warn of the dangers of depending upon one test; periodic checks are urged. Occasionally the test is a very pale blue, which cannot be called a definitive negative (dark blue) or positive (colorless). We consider these as equivocal and request the patient to return for a repeat test on the grounds that the first was unsatisfactory. We have noted that these equivocal results are sometimes frankly positive when the second test follows one of the suggested meals.

Table 1—Data Regarding Persons with Negative Screening Results—July 1, 1954 to June 30, 1956 (13,492 Tests on 11,238 Persons)

		Per cent
1.	Reason for Visit	
	Self referral	78
	Physician referral	12
	Friend referral	3
	Result of publicity	5
	Diabetes in family	2
2.	Age Groupings	
	–19	5
	20–29	18
	30–49	45
	50–69	28
	70+	4
3.	Diabetes in Family	
	Yes	22
	No	78
4.	Chest x-rayed at time of visit	92
5.	Time Since Last Meal	
	½ hour or less	20
	1 hour or less	16
	1½ hours or less	14
	2 hours or less	21
	2½ hours or less	29
6.	Percentage of Repeat Visits	
	Visited center once	83
	" " twice	16
	" " three times or more	1

* This quantity was in slight error and has since been corrected. We are now following the method described on p. 369, Chap. 5, "Clinical Diagnosis by Laboratory Methods," (12th ed.), Todd and Sanford, which recommends 10 mgm of sodium fluoride and 1 mgm of thymol per ml of blood. This calls for 0.8 grs of the mixture per gallon of distilled water.

Table 2—Public Health Nurse Follow-Up Visits on the 100 New Diabetics

Nursing Visits Necessary	Number of Cases
None	87
One	9
Two	2
Three	1
Six	1

Data Regarding Positives

Those who have positive screening results receive a letter which states that their blood sugar was found to be abnormal, and that a visit to their physician is indicated. The physician also receives a letter to the effect that his patient's blood sugar screened over 160 mgm per cent on a certain date. A check is made by telephone with the physician in approximately two weeks' time to determine whether or not he has seen the patient. If not, a public health nurse makes a visit to the home; only occasionally does it require two or more nursing visits (Table 2) before the patient does go to his doctor.

From one to two months after the physician receives the initial letter regarding his patient he is sent a form on which he can indicate that the patient: (1) is not diabetic; (2) is an old previously known case of diabetes; (3) is a new diabetic, not previously known; (4) no diagnosis at this time; or (5) is lost or uncooperative. By far the largest majority of cases are definitively diagnosed within one to two months after their visit to the center (Table 3). However, about 15 per cent require prolonged and tedious follow-up through the physician before a diagnosis is finally established.

The 237 persons who had positive screening results represent 2.0 per cent of the total persons screened. Of the 237 positives, 100 or 42.2 per cent were diagnosed as previously unknown cases of diabetes; these 100 new cases made up 0.9 per cent of the total number screened. This was a prevalence rate of previously unknown cases of diabetes of nine per 1,000. There were 59 individuals classified as nondiabetics by their physicians, but it is doubtful that all of these were false-positives as some were ruled nondiabetic on the basis of negative urines or fasting blood sugars. Also, we strongly suspect from remarks made by patients that at least a few of the 52 diabetics reported to us as previously known were actually new cases. It is understandable that under some circumstances an occasional physician might not wish to admit being unaware that a patient under his care was diabetic. No diagnosis was obtained on 26 persons or 11 per cent of the 237 who screened positive, which is a disappointingly high percentage. This last group includes transients, uncooperative individuals, and those who were lost before follow-up could be completed. Table 4 summarizes these data for the two-year period:

While only 52 per cent of all persons screened were 40 years of age and over, 93 per cent of the new diabetics were 40 years and over (Table 5). These data are not remarkable since diabetes

Table 3—Time Lapse Between Positive Screening and Definitive Diagnosis

Time Lapse	Number of Cases
4 weeks or less	60
5 to 8 weeks	10
9 to 25 weeks	14
6 months to 1 year	8
1 year plus	4
Unknown	4

is generally accepted as being a disease of the older age groups or, as stated by Joslin,* "Age 40 is the year of life at which one should begin to concentrate to prevent diabetes." In Joslin's series, onset of the disease was between the ages of 40 and 70 years in 58.9 per cent of the males and 65.8 per cent of the females.* A diabetes case-finding program would, therefore, be most profitable if special attention were directed toward the screening of that segment of the population 40 years of age and over; this would not, of course, preclude the age groups between 15 and 40 years.

It has been said that diabetes is an occupational hazard of obesity, especially if there is also a history of diabetes in the family. The data in Table 6 merely serve to bear this out; 65 of 96 patients being overweight, 25 of them 30 per cent or more overweight. In the latter group of 25 there were eight females and one male who also gave a family history of diabetes. Interestingly enough, there were 40 who were overweight among the 54 newly discovered diabetic females. A history of weight loss over the preceding five-year period was obtained from 17 persons, in eight of whom the loss was marked.

* Treatment of Diabetes Mellitus. Dr. E. P. Joslin (9th ed.), 1952. Chap. II, Sect. F.

Table 4—Data on the 237 Persons with Positive Screening Results

	First Year	Second Year	Two-Year Totals
New Diabetic	48	52	100
Previously-Known Diabetic	27	25	52
Not Diabetic	20	39	59
No Diagnosis	11	15	26
Total Screened Positive	106	131	237

Table 5—Age Distribution of the Newly Discovered Diabetics

Age	Screened Negative		New Diabetics
Years	Number	Per cent	Number and Per cent
–19	703	5	1
20–29	2,315	18	2
30–39	3,290	25	4
40–49	2,706	20	14
50–59	2,082	16	35
60–69	1,564	12	31
70+	587	4	13

Since 35 per cent of women who have babies with birth weights of nine pounds or over will develop diabetes within ten years, we began on July 1, 1955, to question all married females regarding the birth weights of their children. Between July 1, 1955, and June 30, 1956, 26 married women were newly discovered as diabetics; of these nine gave a history of having babies weighing nine pounds or over.

A family history of diabetes was given by 22 of the 100 newly discovered diabetics. However, 22 per cent of those with negative results also gave a diabetic family history. In this connection it should be remembered that a true history of diabetes is difficult to obtain, except for their immediate parents, since patients lack an accurate knowledge of the medical histories and causes of deaths in their families. A family history of diabetes can be elicited from only about 25 per cent of diabetics who are under regular care by their physicians.

Although 49 per cent of the newly discovered cases in this series stated they had last eaten from 1½ to 2½ hours prior to the test (Table 7), it is nevertheless probable that some cases were missed among those who had last eaten two or more hours before being

tested. We do not believe the present 1½ hour postprandial requirement is causing a loss of many persons. Almost invariably they return for their test when the reason is explained to them. There is also the problem of inadequate "tea and toast" meals which have been taken within the 1½ hour period. These persons too are asked to return after they have eaten one of the suggested meals or its equivalent. It is our impression, although it cannot be documented at this time, that a greater percentage of persons are giving positive screening results since the 1½ hour postprandial test and suggested meals were introduced.

Costs

It is, of course, a practical impossibility to obtain an accurate cost figure. For example, several persons devote varying amounts of time to the diabetes detection program. We made no effort, therefore, to take Health Department personnel into account since they are on the regular payroll anyway, diabetes case finding being only one of their many assignments. If one considers only the actual operation of the center itself, i.e., salary of the technician, insurance, original cost and depreciation of equipment, supplies, and so forth the cost is in the neighborhood of $80 per new case found. Comparisons of this figure with frequently reported costs of finding a new case of tuberculosis, venereal disease, or malignancy are not cogent as there are too many dissimilarities and variables.

Table 6—Per cent Above or Below Desirable Weight

Weight Groupings	Female	Male	Total
Below desirable 10–30%	4	1	5
Desirable + or − 10%	10	16	26
Above desirable 10–30%	19	21	40
" " 30–50%	9	3	12
" " 50% +	12	1	13
	54	42	96*

* No record in 4 cases.

Table 7—Time Since Last Meal

Hours	New Diabetics Per cent	Negatives Per cent
½	17	20
1	24	16
1½	10	14
2	15	21
2½	34	29

Summary

1. There was a prevalence of previously unknown cases of diabetes of nine per 1,000 (0.9 per cent) which may be slightly lower than should have been obtained. An occasional physician's reluctance to admit he was unaware that his patient was diabetic; reliance upon urinalysis and fasting blood specimens as diagnostic tools may also have affected our data.
2. A diabetes case-finding program would be most profitable, if special attention were directed toward the screening of that segment of the population 40 years of age and over.
3. Fewer cases of diabetes will be missed if the screening test is done within 1½ hours of an adequate meal. When the test is equivocal, the patient should be asked to return for retesting.
4. Maximum sensitivity and specificity are obtained when the glucose screening level is at 160 mgm per cent.
5. All but 13 of the newly discovered diabetics visited their physicians without public health nursing follow-up and only four of these required two or more nursing visits. By far the largest majority of cases are definitively diagnosed within one to two months after their visit to the center. However, about 15 per cent require prolonged and tedious follow-up through the physician before a diagnosis is finally established.
6. The costs of the program are in the neighborhood of $80 per new case found. Comparisons of this figure with frequently re-

ported costs of finding a new case of tuberculosis, venereal disease, or malignancy are not cogent as there are too many dissimilarities and variables.

7. We believe diabetes case finding to be a most worth-while local Health Department program in the area of chronic disease. In the case of the Schenectady program the cooperation of two other agencies, the County Health Association and the County Medical Society, made for a most satisfactory working combination.

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The 1960 Cancer Conference: Changing Concepts

The Fourth National Cancer Conference sponsored by the American Cancer Society and the National Cancer Institute will be held in Minneapolis, Minn., from September 13 to 15, 1960. The theme will be "Changing Concepts Concerning Cancer." Each of the three afternoon sessions will be symposia on three aspects of cancer; the nine are on cancer of the breast, lung, female genital tract, gastrointestinal tract, male genitourinary tract, leukemias and lymphomas, skin, head and neck, and cancer control. Among the addresses planned are one on the frontiers of biology and cancer research, and one on care of the advanced cancer patient. Further information from Roal N. Grant, M.D., conference coordinator, Medical Affairs Department, American Cancer Society, 521 West 57th St., New York 19.

What is the influence of vaccination upon the epidemiology of poliomyelitis? Knowledge to answer this question is still inadequate, and the following paper summarizes a series of studies undertaken to remedy this situation. The results seem to indicate that immunization with killed polio vaccines will protect only those inoculated.

INFLUENCE OF VACCINATION WITH FORMALIN INACTIVATED VACCINE UPON GASTRO-INTESTINAL INFECTION WITH POLIOVIRUSES

Martha Lipson Lepow, M.D.; Frederick C. Robbins, M.D.; and Wilna A. Woods, Ph.D.

THIS STUDY was carried out in order to determine what effect vaccination with formalin inactivated poliomyelitis vaccine might have upon the susceptibility of the gastrointestinal tract to poliovirus infection subsequent to natural exposure. Our interest in this matter concerns the possible influence that widespread vaccination may have upon the epidemiology of poliomyelitis. If administration of vaccine were significantly to reduce susceptibility to infection, two results might be expected. First, along with the reduction in paralytic disease the total number of persons excreting virus would be decreased, thus limiting the opportunity for infection of those members of the community who were nonimmune. Second, the virus should eventually disappear from the population, which would mean that immunity could only be acquired from vaccination. On the other hand, if vaccination were not to influence susceptibility to infection, then natural immunization would continue at the same rate as it now does, thus reinforcing immunity artificially acquired. Under these conditions, the need for vaccination in adult life would probably be less.

A number of observations already suggest that vaccination does not significantly influence alimentary infection. Lipson, Robbins, and Woods,[1] Davis, et al.,[2] and Gelfand, Fox, and LeBlanc[3] have all reported that persons, who had received one or two doses of vaccine and were subsequently exposed to poliomyelitis in the family, developed gastrointestinal infection as readily as did nonvaccinated family members similarly exposed. Also, no effect of vaccination could be demonstrated upon the amount of virus in the feces or upon the duration of virus excretion. Few observations have been made in regard to the susceptibility of persons who have received three doses of vaccine properly spaced. However, the meager data available indicate no significant effect upon gastrointestinal infection.[4] Experiments in which subjects previously vaccinated

Table 1—Vaccination Status of Persons Studied

Poliovirus Infection in Family	Not Vaccinated		Vaccinated Children		
	Adults	Children	1 Dose	2 Doses	3 Doses
Yes (67 Families)	107	99	29	37	8
No (57 Families)	101	108	30	25	8

with Salk vaccine have been fed attenuated polioviruses have also indicated that susceptibility of the alimentary tract to infection had not been altered.[5-7]

In this report we summarize studies conducted in our laboratory since 1954. The family contacts of patients with clinical poliomyelitis were selected for investigation, since it could be expected that among them the incidence of infection should be high enough to permit statistical analysis. The excretion of poliovirus by vaccinated and nonvaccinated persons was compared. Determinations of poliomyelitis neutralizing antibody were made on the sera of all persons studied. The immunologic status of the vaccinated children could be contrasted with that of the unimmunized family members, thus providing some evidence concerning the potency of the vaccine.

Plan of Study

Description of the Population

From 1954 through 1957 the members of 124 families were studied. At least one person in each of 67 of these families had acute poliomyelitis. The other 57 families were admitted to the study because of a member in each who had symptoms compatible with clinical poliomyelitis. However, investigation in the laboratory showed that the infection was not due to poliovirus. In some instances the etiology of the case was found to be a Coxsackie or ECHO virus, but in the majority no etiologic agent was defined by the methods employed.

The serologic data from the latter group of families were included solely for the purpose of providing additional information concerning the effect of the vaccine. They are of particular value in this regard since the antibody determinations were not influenced by recent poliovirus infection.

The families were recruited from the vicinity of South Bend, Ind., in 1954, and from Cleveland and environs during the subsequent years. Those from Indiana, 25 in number, were all participants in the 1954 poliomyelitis vaccine field trials and a case of poliomyelitis occurred in each of them.

The socioeconomic status of the study families from the Cleveland area was relatively high. The majority was white and both urban and suburban dwellers were represented. The average family size was five persons with a range of from three to ten. The families in which poliovirus infection was not present included a few more urban dwellers and Negroes.

The number of vaccinated and unvaccinated children and their degree of immunization are presented in Table 1. None of the adults had been vaccinated. Most of the children had received their last dose of vaccine three or more months before they were studied, and in none was the interval less than one month. It is evident that only 16 children, who had received three doses of vaccine properly spaced

were available for study. There were eight additional children who had been given three injections at monthly intervals, according to the schedule employed during the vaccine field trials, but they were arbitrarily considered as having received the equivalent of two effective doses.

All vaccination histories were checked as carefully as possible with the school, health department, private physician, or other authoritative source. It was possible to verify the vaccination of 80 per cent of the children, including all those who had received three doses. In the remaining 20 per cent the statement of the parents had to be accepted.

Investigation of the Patient

A single fecal specimen was obtained for virus isolation within one week of admission to the hospital from each of 123 cases in 119 families. Multiple cases occurred in three families. No fecal specimen was obtained from the patient in five families.

One of the three types of poliovirus was isolated from the case in 58 families. To these 58 families, nine others were added, although no virus was isolated from the patient. In seven the case was characteristic of poliomyelitis and poliovirus was isolated from family contacts. In two others the patient was an adult with severe paralysis; no poliovirus was isolated from either patient or his contacts.

Forty-nine of the cases were paralytic and 18 nonparalytic. Forty-two infections were due to type 1, eight to type 2, and 15 to type 3 virus. The types of virus causing infection in the two previously mentioned cases are unknown.

Sixty-one cases of aseptic meningitis occurred in 57 additional families. Fecal specimens were obtained from 59 of these patients. Twenty of these yielded enteroviruses, none of which proved to be poliovirus. Paired serum specimens from 45 of these 61 cases were tested for poliomyelitis neutralizing antibody, and in no instance was a significant rise in titer demonstrated.

Investigation of Family Contacts

As soon as the index case was admitted to the hospital and the family selected for study, an attempt was made to obtain a fecal and a serum specimen from all household contacts. A stool specimen was secured from each of 281 family contacts of poliomyelitis patients in 67 families.

The specimen was obtained from the residents of the Cleveland area within less than one week of the time that the index case was recognized, except in one family where the interval was ten days. In Indiana, collection was less prompt. Fecal specimens were obtained from 97 persons in 25 families. Fifty-nine specimens were secured within two weeks after recognition of the index case and 38 between two and four weeks.

A serum specimen was drawn at approximately the same time as the fecal sample was obtained. Sera were secured from 163 of the 180 contacts under 16 years of age and from 104 of the 107 adults. No effort was made to acquire a second sample from these persons.

Those families in which the case was not poliomyelitis were all from the vicinity of Cleveland. A fecal specimen was obtained from 240 of 280 contacts and poliovirus was isolated from only one. This virus was type 2 and the donor was an adult who had had only casual contact with one of the cases. No other member of the family was found to be excreting this virus; nor did any of them show serologic evidence of type 2 poliovirus infection.

Paired sera from 66 per cent of the contacts within these families were tested for poliomyelitis neutralizing antibody. None showed a significant rise in titer, providing further evidence that no recent poliovirus infection had occurred.

Table 2—Presence of Poliomyelitis Virus in Feces of Family Contacts of Poliomyelitis Patients

Age	Not Vaccinated			1 Dose			2 Doses			3 Doses		
	Studied	Number Positive	Per cent	Studied	Number Positive	Per cent	Studied	Number Positive	Per cent	Studied	Number Positive	Per cent
0 to 4 years	44	36	82	4	2	–	8	6	–	3	2	–
5 to 9 years	32	21	65	19	11	58	25	15	60	2	1	–
10 to 16 years	23	6	26	5	3	–	5	0	0	3	0	0
	—	—	—	—	—	—	—	—	—	—	—	—
Total	99	63	64	28	16	57	38	21	55	8	3	–
16 years and over	105	11	10									

Materials and Methods

Virus Isolations

All virus isolations were performed in monolayer tissue cultures of trypsin dispersed monkey kidney cells according to the method of Youngner.[8]

Negative cultures were held for seven days. The tissue culture fluid was then harvested and passed to new cultures which again were observed for seven days. If they were still negative no further passages were attempted but the isolation was repeated with an inoculum of 1.0 ml.

Viruses isolated were identified by neutralization with standard hyperimmune poliomyelitis monkey sera. Sera supplied by Dr. Herbert Wenner as well as some produced in our own laboratory were used. Agents which were not neutralized by the individual antisera were then tested with a mixture of the three types. Agents not neutralized by the mixture were considered to be viruses other than poliomyelitis.

Serum Neutralization Tests

Neutralizing serum antibody was determined by the metabolic inhibition test of Salk, Youngner, and Ward.[9] Serial twofold dilutions of serum were made starting at 1:4 with one tube per dilution. Virus strains used were Mahoney (type 1), MEF (type 2), and Saukett (type 3). A calculated 100 ID50 was employed in each test, but the actual dose varied between 10 and 1,000 ID50. Results are expressed as the reciprocal of the initial serum dilution.

Results

Virus Excretion

Table 2 presents the results of virus isolations from fecal specimens of family contacts of poliomyelitis cases by age and vaccination status. Results from 1954 through 1957 have been totaled,

although the vaccine used may have differed in potency from year to year, and many different lots from the various manufacturers are represented.

The age groups are unequal in size and due to the method of vaccine distribution, particularly in 1955 and early in 1956, the majority of vaccinated children were in the five-to-nine-year-age group. Indeed, in 1955 and 1956, it was difficult to find children within that age group who had not received vaccine. Consequently, the unvaccinated children five to nine years in age were mainly from Indiana in 1954.

It is evident from examination of the columns entitled "not vaccinated" that the rate of virus isolation is very high (82 per cent) from children less than four years of age, and decreases as age increases. Sixty-five per cent of those five to nine years old, 26 per cent of those 10-16 years old, and 10 per cent of the adults were found to be excreting the type of poliovirus responsible for the family infection.

There are too few children less than four years of age who had received vaccine to permit comparison with the very large group who had not. However, within the age group five to nine, comparison is possible. Sixty-five per cent of the unvaccinated children, 58 per cent of those who had received one dose of vaccine, and 60 per cent of those who had received two doses of vaccine were found to be excreting virus. These differences are not significant when tested by the chi square method.

If the results on all children under 16 years of age are totaled, the groups are larger and percentages somewhat more valid. It will be seen that 64 per cent of the unvaccinated controls were excreting poliovirus, whereas 57 per cent and 55 per cent of those who had received one and two doses of vaccine, respectively, were positive.

Of the eight children tested who had received three doses of vaccine, three were excreting virus. It is worth noting that three of the five who were not infected were over ten years of age.

Antibody Data

The results of the determinations of neutralizing antibodies in the sera of the family contacts were analyzed from two points of view. First, did the vaccinated individuals differ immunologically from those not vaccinated, thus providing a criterion of the effectiveness of the immunization? Secondly, was there any evidence that circulating antibody did or did not influence susceptibility of the gastrointestinal tract to infection?

The results of tests for neutralizing antibodies in families not infected with poliovirus will be considered first (Figures 1, 2, and 3). The titer of antibody to each type of poliovirus is shown in a separate figure. All results included are those on the first serum secured from the individual, usually at the time that the fecal specimen was obtained. It will be recalled that these were all from Cleveland and vicinity and were studied in 1955 and 1956. The age distribution within the various categories is shown in Table 3. It is evident that the average age of the unvaccinated children is somewhat lower

Figure 1—Poliomyelitis Antibodies in Individuals Without Recent Poliomyelitis Infection Type I

Figure 2—Poliomyelitis Antibodies in Individuals Without Recent Poliomyelitis Infection Type II

than that of the vaccinated ones and this must be taken into consideration in evaluating the results.

On inspection of the figures no striking difference between the unvaccinated and vaccinated children is apparent. Fifty per cent of the unvaccinated children had antibody titers of less than four to type 1 virus. Only eight, or 21 per cent, of the 38 children who had received a single dose of vaccine had no detectable antibody, but surprisingly 15 or 66 per cent of the 24 who had had two doses lacked antibody to type 1 virus. Only seven children were studied who had been given three injections and two of them had no antibody. Among the 82 adults, 16 or approximately 20 per cent had antibody titers of less than four.

When the antibody to type 2 virus is considered the results in the unvaccinated children and those vaccinated once are similar to those for type 1. However, only three of the children who had received two doses of vaccine and one of those with three doses lacked antibody to type 2. More of the adults were found to have type 2 antibody than type 1. The pattern of type 3 antibodies does not differ to any great degree from that observed for type 1.

Thus, from these data it is difficult to demonstrate that vaccination as performed in 1955 and 1956 had any significant effect in increasing the numbers of persons possessing antibodies to types 1 and 3 polioviruses, or upon the levels of antibody in their sera. Some effect in regard to type 2 antibody is evident, but it is not striking.

Contacts of poliomyelitis patients were studied in the same manner. The evaluation of these results was complicated by the presence of infection with one of the three types of polioviruses at the time that the sera were obtained. Thus, few observations were available concerning the possible effect of vaccination upon type 1 antibody, since most of the infections were due to this type of virus. Although a few individuals did not exhibit homotypic antibody, even though vaccinated, the majority possessed significant levels which could have been the result of the present exposure and could not be ascribed to vaccine. The levels of heterotypic antibody were not different to a noticeable degree from those observed in the families in whom recent poliomyelitis exposure was not a factor.

Figure 4 presents an analysis of heterotypic antibody status of all family contacts of poliomyelitis cases by age and vaccination status. The columns indicate the per cent in each age group with a level of 1:4 or greater of neutralizing antibody to each type of virus.

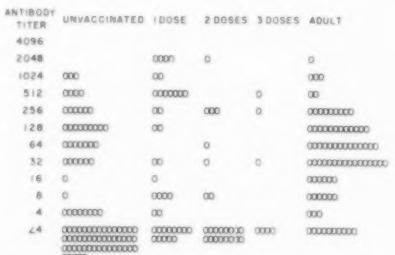

Figure 3—Poliomyelitis Antibodies in Individuals Without Recent Poliomyelitis Infection Type III

Only results on vaccinated children in the five to nine-year-age group are presented, since the number of vaccinated children in the other age groups was too small to allow for adequate comparison. Also, no breakdown was made according to the number of doses of vaccine the children had received, again because of the small size of the groups. The children, five to nine years of age, were more likely to possess antibody to each of the types of poliovirus than were persons within any of the other age groups. Some benefit of vaccination is evident within the specific age group. However, the difference is not great, particularly in regard to type 1 antibody.

Obviously, the data presented in this report do not lend themselves to any analysis of the influence of homotypic antibody present prior to exposure since infection was established within the family before sera were obtained. In contrast to homotypic antibody, it is probably reasonable to assume that heterotypic antibodies were present before the individual was exposed to the virus currently causing infection in the family. An analysis was made of the possible effect of heterotypic type 2 antibody upon susceptibility of the alimentary tract to infection with polioviruses types 1 and 3. Salk[10] and Hammon, et al.,[11] have presented evidence indicating that in human beings presence of type 2 antibody confers some degree of protection against paralysis upon infection with type 1 virus. Bodian has reported similar observations in monkeys.[12] The data of Brown and Ainslie[13] suggest that the presence of type 2 antibody may alter gastrointestinal infection with type 1 virus. Indeed, Salk has proposed that there is some antigenic relationship between type 2 virus and types 1 and 3.

As can readily be seen on inspection of Table 4, children possessing type 2 antibody in their sera had the same rate of infection with types 1 and 3 viruses as did those with no antibody to this type. Conversely, among those found to be excreting type 1 or 3 virus the same proportions were found to have type 2 antibody as among those with no virus in their feces. Although not presented in the table, there was no difference between the results in the vaccinated and unvaccinated children; nor did the titer of antibody appear to influence the findings. These data do not support the hypothesis that the prior existence of type 2 antibody reduces the susceptibility of the gastrointestinal tract to infection with heterotypic polioviruses.

Additional evidence indicating that heterotypic antibody has little influence upon gastrointestinal infection is provided by comparing the data in Figure

Table 3—Age Distribution of Vaccinated and Unvaccinated Members of 57 Families Without Recent Poliomyelitis Infection

Age	Not Vaccinated	Vaccination Status		
		1 Dose	2 Doses	3 Doses
0 to 4 years	55	4	8	2
5 to 9 years	27	23	13	5
10 to 16 years	26	3	4	1
Total	108	30	25	8
16 years and over	101	0	0	0

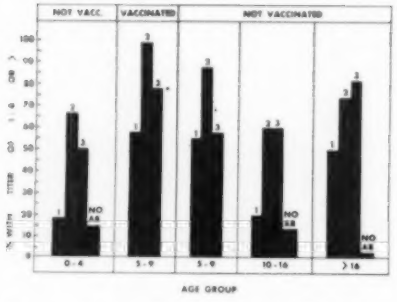

Figure 4—Family Contacts of Poliomyelitis Cases Heterotypic Neutralizing Antibody by Age Group and Vaccination Status

4 on the presence of antibody in various age groups with the results of virus isolation in these same persons (Table 2). It is immediately apparent that there is no correlation between the incidence of demonstrable heterotypic neutralizing antibodies and the numbers of persons from whom virus was isolated. For example, a greater proportion of children in the five-to-nine-age group was found to possess poliomyelitis antibodies than did those in the 10-to-16-year-age group. However, 65 per cent of the former were found to be infected as compared to 26 per cent of the latter. On the other hand, there was good correlation with age of the individual; the older the person, the less likely was he to be excreting virus. If one assumes that the data in Figure 4 concerning heterotypic antibody roughly indicate the incidence of antibody in the study population to the three types of poliovirus prior to exposure to infection, it would seem that there is also a lack of correlation between the presence of homotypic antibody and susceptibility to infection.

The marked effect of age upon the incidence of gastrointestinal infection, apparently independent of the presence of circulating antibody, has been of considerable interest to us. Further evidence concerning this is furnished by the following observation. Among the total group of children exposed to poliovirus in the home, there were 19 who were found to have homotypic antibody titers of less than four. Fecal specimens were available from 15 of these and poliovirus was isolated from ten. It is perhaps worth mentioning that four of the five children who did not have virus in their stools were siblings exposed to a case due to type 3 virus and their exposure to the patient, whose disease followed tonsillectomy, was minimal as compared to the situation in other families. In contrast to the children, 13 adults who also possessed no homotypic antibody in their sera were examined and only two were found to be excreting poliovirus. This discrepancy might be explained in several ways. The adult may have less opportunity of becoming infected than the child. Even though infection occurs, it might be more difficult to demonstrate virus in the fecal specimen of the adult than in that of the child. Finally, it is possible that the cells of the adult intestine develop a resistance to poliovirus infection that is not related to serum antibody.

It was observed that only three of the 11 parents from whom virus was isolated were fathers. This suggests that differences in exposure do exist within the family group and may, in part, explain the lower rate of virus isolation from adults. There is also evidence to indicate that virus is less often isolated from the adult than from the child, even though infection is known to have occurred. Sabin and Ward,[14] in 1941 and, more recently, Svedmyr[15] noted that poliovirus was isolated more frequently from children with paralytic poliomyelitis than from adults. The results in our own laboratory are entirely comparable with those of the other investigators mentioned. Virus was

isolated from the feces of 89 per cent of 159 children 16 years of age or younger with paralytic poliomyelitis, whereas only 72 per cent of 69 adults with paralytic disease were demonstrated to have virus in their gastrointestinal tracts. The reason why it is more difficult to demonstrate virus in the alimentary tract of the infected adult is not known. Regardless of the reason, it would seem that the frequency with which family contacts can be demonstrated by stool isolation procedures to be infected with poliovirus is to a considerable extent dependent upon the age of the subjects and, to some degree, independent of the presence or absence of neutralizing serum antibody. Thus, in attempting to compare two groups of persons in regard to virus excretion it is important to consider the age distribution within the groups.

Discussion

The results of this study would indicate that the prior administration of one or two doses of inactivated poliomyelitis vaccine does not reduce the susceptibility of the lower gastrointestinal tract of man to poliovirus infection. These results are in accord with those of Fox,[4] Davis,[2] Koprowski,[16] and Sabin.[5]

The epidemiologic implications of these findings have already been suggested in the introductory paragraphs. Vaccination cannot be expected to decrease significantly the number of persons in the community suffering from inapparent poliovirus infections. Therefore, the opportunities of becoming infected will be the same as before vaccine was used, although paralytic disease can be expected to be less frequent. Thus, in order to achieve the maximum degree of protection from paralytic poliomyelitis with the present killed vaccine, vaccination should be as universal as possible throughout childhood and early adult life.

Two major deficiencies in our investigation warrant comment.

First, we have no data concerning the effect of vaccination upon virus in the pharynx. Wehrle[17] has presented evidence suggesting that poliovirus is less frequently demonstrated in the throats of vaccinated persons exposed to poliovirus in the home than in the throats of those not vaccinated. The epidemiologic significance of this observation is difficult to assess since the importance of pharyngeal virus in the transmission of poliomyelitis is not known (Sabin[18]). More data in this regard would be highly desirable.

Second, few observations have been made upon children who were properly

Table 4—The Influence of Type 2 Antibody upon the Susceptibility to Gastrointestinal Infection with Types 1 and 3 Polioviruses*

	Type 2 Antibody Present	Type 2 Antibody Absent	Total	Per cent with Type 2 Antibody
Feces + for virus	64	16	80	80
No virus in feces	43	11	54	80
Total	107	27	134	
Per cent Positive	60	60	60	

* Data limited to children under 16 years of age.

immunized with three or more injections of vaccine. The few data we have presented, as well as those of Fox,[4] indicate that such children are not entirely resistant to infection and probably do not differ from those less well immunized. If circulating antibody does not influence susceptibility of the bowel to infection, one would not anticipate that additional injections of vaccine would alter the results.

This raises the question of whether or not antibody per se does influence the susceptibility of the bowel to infection. We are fully aware that the evidence we have presented in regard to the influence of homotypic antibody is indirect and, to some extent, suspect. However, it does suggest that infection of the lower gastrointestinal tract of man has little relationship to the presence or absence of neutralizing serum antibody. The observations of Koprowski[19] and Sabin[5] with avirulent viruses, and Fox[4] with natural infection provide more direct evidence concerning this question. They indicate that antibody, either acquired passively from the mother or resulting from vaccination with killed vaccine, has no effect upon the susceptibility of the bowel.

Data that would appear to contradict those presented above have been recorded by Howe[20,21] from experiments in chimpanzees. He found that vaccinated chimpanzees were less easily infected than unvaccinated controls and, if infected, they excreted less virus for a shorter period of time. Also, he did find a correlation between the level of antibody in the serum of the animal and the ease with which gastrointestinal infections could be established. The different results in man and the chimpanzee may be explained by the fact that according to Sabin,[18] the cells of the lower bowel of the chimpanzee do not support the multiplication of poliovirus as readily as do those of man. Thus, most of the virus detected in the feces of the chimpanzee is the result of multiplication in the pharynx whereas in man viral growth is greater in the lower bowel. The different findings in man and the chimpanzee would be compatible with the hypothesis that multiplication of virus in the pharynx is inhibited by antibody present in the blood, but multiplication in the lower bowel is not.

Some comment should be made concerning the antibody levels observed in the sera of vaccinated children. It will be recalled that the sera for antibody determination were obtained in the late summer and, in most instances, the vaccine had been administered the preceding spring. Our failure to find any clear-cut differences between the vaccinated and unvaccinated children either in regard to the presence of antibody or levels of antibody is somewhat disturbing. Some doubt might be raised concerning the potency of the vaccines used in the population studied. One might also regard these data as emphasizing the importance of giving more than two doses of vaccine.

If the findings of our study indicate the true situation, it might well be asked why the incidence of poliomyelitis in the United States has fallen so dramatically within the past two years, coincident with the introduction of vaccination. Among the significant number of persons not yet immunized cases should occur if vaccination has not reduced the opportunity for exposure. Obviously, no definitive answer is possible, particularly in view of our poor state of knowledge concerning the method of spread of the poliovirus. However, several possibilities come to mind:

1. It may be that by the methods we have employed it is not possible to detect relatively small differences in the viral excretion by vaccinated and unvaccinated persons. Also, little information is available concerning the effect of three or more doses of vaccine. As pointed out by Bodian,[22] in those parts of the world

with good sanitation, such as the United States, the polioviruses seem to spread throughout the community with some difficulty. This balance may be so delicate that a relatively minor change in conditions could have a marked effect upon the ecology of the virus in nature.

2. As indicated earlier, few data are available concerning the influence of vaccination upon pharyngeal virus. However, the data of Wehrle[17] do suggest that vaccination reduces the susceptibility of the pharynx to poliovirus infection and this may prove to be of epidemiologic significance.

3. The decreased incidence of poliomyelitis may be unrelated to vaccination, but due solely to the unexplained natural fluctuations of the disease.

All three possibilities are suggested on speculative grounds and are not susceptible of proof in the present state of our knowledge. However, it would seem wise at this time to assume that vaccination with killed virus will not limit to a significant degree spread of the poliovirus.

Summary

The influence of vaccination with killed poliomyelitis vaccine upon the susceptibility of the gastrointestinal tract to polioviruses was investigated. Family contacts of known cases of poliomyelitis were studied. Children vaccinated with one or two doses were found to be excreting virus as frequently in their feces as were their unvaccinated peers. Only eight children who had received three properly spaced injections of vaccine were available for study and poliovirus was isolated from three.

In order to determine whether or not vaccination had been effective in evoking neutralizing antibody, tests were run on the sera of many of the family contacts of poliomyelitis patients. Additional data of the same type were accumulated from persons in families in which there was no poliovirus infection. Comparisons in regard to the presence or absence of antibody and the titer of antibody revealed little differences between the vaccinated and unvaccinated children. What differences were observed indicated that the type 2 component of the vaccine was a better antigen than types 1 and 3.

Data are presented which suggest that neutralizing antibody in the blood has little influence upon the susceptibility of the lower intestinal tract of man to poliovirus infection. However, the age of the individual, unrelated to the presence of antibody, correlates well with the presence of virus in the feces. The younger the person, the more likely is he to be infected. Evidence is also presented, in confirmation of that of others, indicating that even in persons known to be infected with poliovirus, the virus is more frequently isolated from children than from adults.

It is concluded that immunization with killed poliomyelitis vaccines cannot be expected to decrease the numbers of persons in the community with alimentary poliovirus infection. Thus, vaccination, while of value to the persons immunized, is unlikely to provide protection to those not vaccinated.

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Portions of this study were presented at the 48th Annual Meeting of the American Society for Clinical Investigation held in Atlantic City, N. J., April 30, 1956, and at the 85th Annual Meeting of the American Public Health Association in Cleveland, Ohio, November 11-15, 1957.

Spring Activity: Affiliated Societies and Regional Branches

Those interested in attending meetings of our affiliates may note the fact that during April and May, 25 of the affiliates and branches of the APHA will be conducting their annual meetings, as shown on the calendar of events on page 616 in this issue. For complete listings of Affiliated Societies and Regional Branches and the names and addresses of their secretaries, readers are referred to page 582.

This is a report on a joint evaluation of influenza and adenovirus vaccines in the prevention of respiratory illnesses. The effort was made when influenza and adenovirus infections were prevalent.

COMBINATIONS OF ASIAN INFLUENZA VIRUS AND ADENOVIRUS VACCINE IN THE PROPHYLAXIS OF RESPIRATORY ILLNESS OF NAVY RECRUITS (PART I)

Lieutenant Irwin Schultz, MC, USNR; W. T. Stille, M.S.; Commander B. F. Gundelfinger, MC, USN; and Captain Lloyd F. Miller, MC, USN

PREVIOUS STUDIES have established the value of influenza vaccine of proper antigenic composition in preventing illness among immunized individuals.[1-3] An accurate estimate of vaccine effectiveness has been hampered by the infrequent occurrence of clinically indistinguishable respiratory illnesses together with influenza which can obscure the effect of the vaccine.[4,5] A common fellow traveler of influenza in military populations has been the adenovirus.[6] The type of illness now known to be associated with this agent has previously been called "febrile catarrh" by Stuart-Harris[4] during the outbreaks of influenza in the 1930's and more recently has been referred to as acute respiratory disease or ARD.[7] Field trials by Stallones, et al.,[8] and Bell, et al.,[9] have reported the effectiveness of adenovirus vaccines against ARD. Because epidemic and endemic illness related to influenza and adenovirus are so common in recruit camps, programs have been adopted by all branches of military service which would utilize vaccines against both diseases. This is the first report of a joint evaluation of both influenza and adenovirus vaccines in the prophylaxis of respiratory illnesses during periods when influenza and adenovirus infections were prevalent.

The advance information heralding the onset of Asian influenza[10] in the summer and fall of 1957 provided what may be the first opportunity for conducting a controlled field trial of both vaccines under ideal conditions. Such a study would be expected to answer the following questions: (1) How effective is each vaccine? (2) Is a combination of both as effective in the prevention of over-all respiratory illness as may be expected from the effect of each vaccine separately? The present paper concerns the period of maximum incidence of Asian influenza in the fall of 1957. Adenovirus infections occurred concurrently and throughout the entire period. A subsequent report will consider the experience in the waning

phases of the influenza epidemic when adenovirus illness became more prominent.

Methods

Monovalent Asian influenza virus vaccine of two lots[11] reported by the manufacturer* to contain 200 CCA units per ml of influenza virus A/Japan/305-57, and a polyvalent adenovirus vaccine containing types 3, 4, and 7† were used in this study. Formalinized maintenance medium 199 was used as a placebo. The inoculations, all subcutaneous, were given from August 10 to September 4, 1957, to 1,443 Navy recruits who volunteered to participate and did not report sensitivity to poultry products. Additional men were inoculated during, and subsequent to, this period with a non-Asian influenza virus vaccine. These men, and their controls, are not of direct interest in the present study and are excluded from this analysis, having been considered previously.[11]

The men were assigned to four inoculation groups by a stratified random procedure so that about half the men received adenovirus vaccine and less than half received the influenza vaccine. Thus, 339 men received 1 ml of influenza and 1 ml of adenovirus vaccine, 274 men received 1 ml of influenza vaccine only; 411 men received 1 ml of adenovirus vaccine only; and 419 men received a placebo. These inoculations were given along with other standard Navy inoculations and the men had no knowledge of which study inoculation they received. The administrative and medical personnel seeing patients were also without knowledge of the vaccine status of any particular men.

* Parke, Davis and Company. Kindly made available by Drs. J. A. Bell of the National Institute of Health and F. M. Davenport of the Armed Forces Epidemiological Board.

† Kindly supplied by Eli Lilly and Company to Dr. Clayton G. Loosli for study use.

Illness experience was determined from standard Navy records of dispensary visits and hospital admissions which we transcribed onto cards for machine processing of data. Each illness was classified as respiratory or nonrespiratory by the information in the records or the diagnosis established by a medical officer. Respiratory illnesses were considered to be febrile if the maximum oral temperature was 100° F or more. Hospitalized respiratory illnesses are included in the febrile category since only rarely were men admitted with temperatures less than 100°F. Symptoms reported several times were considered to be part of a single illness unless an interval of seven days occurred between reports. Since a period of at least ten days has been noted before vaccines could afford protection,[11] illnesses occurring within this period were excluded from this evaluation.

Throat swabs for bacterial and viral isolation were obtained from men reporting illness and analyzed by standard laboratory methods referred to elsewhere.[12,13] Serological studies on acute and 21-day convalescent blood specimens were performed in the usual manner.[13]

Results

Respiratory illness rates and the population at risk in studies of influenza and adenovirus vaccines in 1957-1958 are shown in Figure 1. The subsequent study to be reported overlaps slightly with the present study, but the individual analyses are presented separately. A sharp peak reflecting the height of the influenza epidemic is shown in October which corresponds to the peak incidence occurring in most parts of the United States.[14] The smaller peaks in January and March reflect the highest incidence of illness related predominately to adenovirus. The 1,443 recruits in this first study made 2,962 visits

to sick call. Of these, 2,179 were for respiratory complaints and were interpreted to represent 764 respiratory illnesses, exclusive of illnesses in or beginning in the first ten days. About half of these illnesses were further classified as febrile and 192 of these resulted in hospitalization. These data are summarized by vaccine groups in Table 1. An analysis of part of these data and other data relating only to the influenza vaccine was included in an earlier report.[11]

Each of the vaccines was associated with reductions in illnesses, particularly in febrile and hospitalized respiratory illnesses when compared to the placebo group. The lowest rates were observed in the group receiving both the monovalent Asian and adenovirus vaccines. The data for afebrile respiratory disease are interesting and will be discussed subsequently. It appears that vaccine groups with the lowest febrile illness rates experienced the most afebrile illness. The total illness of the placebo group was, nevertheless, higher than that of any vaccine group.

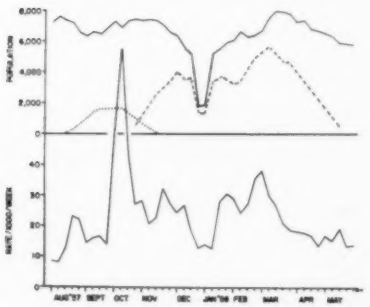

Figure 1—Populations at Risk (Upper Figure) and Respiratory Illness Hospitalizations (Lower Figure) for All Recruits at Great Lakes. In the Upper Figure the Dotted Line Indicates the Populations Covered by this Report. The Dashed Line Indicates the Population, Whose Experience Will Be Presented in a Subsequent Report.

Figure 2 shows the reported febrile illness rates for each of the vaccine groups by calendar week. During the first two weeks of the study, the populations at risk were relatively small (less than 50 men per group) and differences among groups were not statistically significant. Throughout the remainder of the study all vaccine groups reported less illness than men receiving a placebo. The reduction in illness is greatest in groups receiving Asian influenza vaccine and is particularly striking during the three-week period of highest influenza incidence—weeks ending on October 5, 12, and 19. Augmented protection for men who received adenovirus vaccine in addition to Asian monovalent vaccine is evident primarily after this peak.

During the period shown in Figure 2, 151 adenovirus and 56 influenza viruses were isolated. The populations sampled varied and interruptions occurred, so that no quantitative expression can be given to these data. It is clear, however, that both viruses were prevalent in recruits during this entire period. This contention is also supported by complement-fixation antibody titer changes of paired sera obtained throughout this period.

Table 2 summarizes the protective effect of the vaccines used. The reduction in febrile illness associated with each vaccine can be determined by a comparison to the control group. The statistical significance of the relative reductions observed is also indicated. The observed effectiveness of either vaccine would be expected to be more obvious when the control group used for comparison received one of the vaccines. This expectation is based on the premise that the vaccine given to both the test and control groups would eliminate its specific illness component and thus permit a more clearly defined evaluation of the test vaccine in the absence of the component reduced or

Table 1—Number of Illnesses (and Training Period Rates/1,000 Men*) Newly Reported by Navy Recruits, Great Lakes, Ill., 1957

Illness Category	Vaccine Status				Probability of ≥Difference Due to Chance† 3d.f.
	Asian Influenza and Adenovirus Vaccines	Adenovirus Vaccines	Asian Influenza Vaccines	Placebo	
Respiratory illness					
Hospitalized	16(47)	73(178)	18(66)	85(203)	≪0.01
Outpatients					
Febrile	28(83)	45(109)	26(95)	83(198)	≪0.01
Afebrile	111(327)	98(238)	82(299)	99(236)	<0.05
Nonrespiratory episodes	65(192)	66(161)	54(197)	91(217)	0.30
Febrile and hosp. R.I.	44(130)	118(287)	44(161)	168(401)	≪0.01
All R.I.	155(457)	216(526)	126(460)	267(637)	<0.01
Total illness and episodes reported	220(649)	282(686)	180(657)	358(855)	<0.01
Population initially at risk	339	411	274	419	

* Elimination of first 10 days postinoculation leaves 7.5 weeks average training period.
† Probability of less than 0.05 are regarded as too unlikely to be due to chance; presumably the differences in such instances are due to phenomena associated with the group (i.e. vaccinations).

eliminated. However, considering influenza vaccine as the vaccine under test, the relative reduction, compared to the placebo (comparison 1, Table 2) is 60 per cent, but when both the test and control groups received adenovirus vaccine (comparison 5) the relative reduction is 55 per cent. Similarly, considering adenovirus vaccine to be the test vaccine, the relative reduction with influenza infection uncontrolled is 28 per cent (comparison 2) and controlling influenza infection by vaccination of test and control with influenza vaccine, the relative reduction is 19 per cent (comparison 4). Thus, in both instances the control of the presumably unrelated illnesses failed to yield a more pronounced efficacy of the vaccine under test. The apparent protection of the combined vaccine (68 per cent) was not as great as the summation of protection (88 per cent) afforded by the vaccines individually (60 per cent + 28 per cent). The probability of a difference of this degree, or larger, occurring by chance is 0.15 (15 per cent). Hence, this observation lacks statistical significance, and may be regarded appropriately as an accident of sampling.

Since some recruits experience more than one febrile respiratory illness during training, it may be argued that one reported illness may be associated with influenza, another with adenovirus, and so forth. The data were examined further on the basis of the numbers of men reporting illness rather than in terms of the numbers of illnesses observed. Elimination of the multiplicity of illnesses experienced by each man did not alter the relative reductions significantly (Figure 3). However, the greatest reduction was in the placebo group, which suggests the possibility that the unvaccinated groups in par-

ticular, experienced more than one illness that could have been prevented by vaccination.

Discussion

The data presented in this first study demonstrate the effectiveness of influenza and adenovirus vaccines singly and in combination when both agents were known to cause illness although influenza was most prevalent. The vaccines used were antigenically potent as determined in control studies. Each vaccine was considered highly effective against the specific febrile illness it was designed to prevent. Differences in the relative reductions observed appear to be conditioned in part by the intensity and character of the epidemic and the prevalence of each agent. Presumably, laboratory data would have amplified these points further.

Outbreaks of respiratory diseases of mixed etiology are not uncommon among military recruits.[15,16] Evaluation of a vaccine during these outbreaks can be quite confusing. Salk and Rapalski[16] have recently reported a study evaluating an influenza vaccine in which most of the illness occurring in the vaccinated men was serologically negative for influenza, and possibly caused by an adenovirus. The results of their

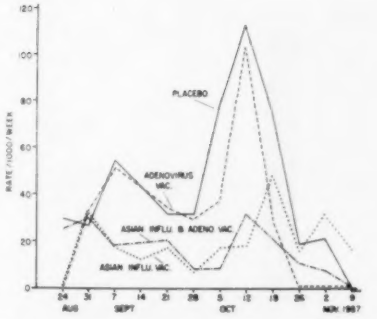

Figure 2—Febrile Respiratory Illnesses of Navy Recruits in the Study Groups, Great Lakes, Ill.

Table 2—Comparisons Among Vaccine Groups in the Prophylaxis of New Febrile and/or Hospitalized Respiratory Illness, Great Lakes, Ill., 1957

Vaccine Group Compared	Febrile Respiratory Illness Rates Observed*	Relative Reduction in Rates (Per cent)	Chi Square (1d.f.)	Probability of ≥Difference Due to Chance
Asian influenza only	161			
vs. placebo	401	60	24.711	≪0.01
Adenovirus only	287			
vs. placebo	401	28	7.791	<0.01
Asian influenza + adenovirus	130			
vs. placebo	401	68	49.240	≪0.01
Asian influenza + adenovirus	130			
vs. Asian influenza only	161	19	1.016	0.30
Asian influenza + adenovirus	130			
vs. adenovirus only	287	55	21.249	≪0.01
Asian influenza only	161			
vs. adenovirus only	287	44	11.127	<0.01

The first and fifth comparison estimate the effect of Asian influenza vaccine.
The second and fourth comparison estimate the effect of adenovirus vaccine.
* Rates/1,000 per training period (about 7½ weeks).

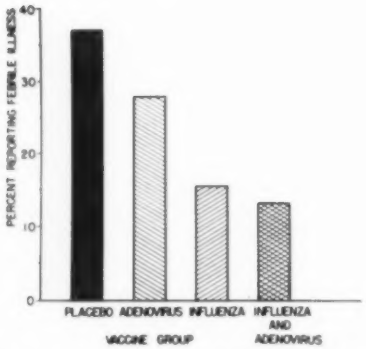

Figure 3—Per cent of Each Vaccine Group Reporting at Least One Febrile Respiratory Illness (and/or Hospitalization), Exclusive of the First Ten Days Postinoculation, Great Lakes, Ill., 1957

protection study, analyzing hospital admissions in vaccine and control groups, revealed about a 20 per cent relative reduction for immunized men in a period of high prevalence of noninfluenzal illness. Their analyses of cases serologically positive for A influenza yielded a relative reduction of about 70 per cent.

It seems likely that laboratory data, permitting a specific diagnosis in each case, might have yielded even greater relative reductions in our study than those observed on a purely clinical evaluation. Although, in the aggregate, there are clinical differences in the manifestations of illness associated with influenza and adenovirus,[17] the use of clinical observations to make a specific diagnosis in vaccine studies remains hazardous.

A review of the problems affecting prophylaxis of respiratory disease in recruits has been presented by Dingle.[13] Numerous studies have established the effectiveness of vaccines against influenza and, more recently, adenovirus illness. The combined use of these vaccines can be expected to reduce the problem of respiratory illness in recruit camps. The data presented in this report indicated a 68 per cent relative reduction in illness occurred during a mixed epidemic when both vaccines were used.

Febrile respiratory illness still occurs in vaccinated men, and speculation is warranted as to its cause. Some of the illnesses are quite possibly true vaccine failures; others may be caused by a variety of agents identifiable as well as unknown. Coxsackie viruses[19] and group A streptococci[20] were associated with febrile illnesses. Since the conditions for the spread of infective agents remain relatively unchanged in recruit camps, control of adenovirus and influenza infections may make other agents more noticeable in causing recruit illness.

Another by-product of the use of vaccines which prevent the febrile illnesses associated with influenza and adenovirus infection is the somewhat enigmatic occurrence of an excess of afebrile illness in vaccinated men referred to above. The data appear to reflect conversion of febrile to afebrile illness by the vaccines suggesting an ameliorative rather than a simple prophylactic effect. There is at present, however, no laboratory evidence to verify this possibility. An explanation must also consider the vagaries of recruit behavior in relation to respiratory illness. It is suggested that men who are prevented from reporting the prevalent febrile illnesses will, nevertheless, be motivated to go to sick call with symptoms of common respiratory diseases which are known to occur throughout recruit training, but which are ordinarily not reported. During well publicized epidemics in particular, the need to report even slight illness may be increased among vaccinated men who have been prevented from reporting

the more severe kinds of illness resulting in hospitalization of men not receiving the vaccine. Thus, routine use of these vaccines may not see any reduction in reported afebrile illness. In fact, the number of these illnesses reported may be expected to increase. The present study is not alone in reporting data of this kind relating to an excess of afebrile illness in vaccinated men.[21]

Summary and Conclusions

A 200 CCA unit of monovalent Asian influenza virus vaccine and a polyvalent adenovirus vaccine (types 3, 4, and 7) were evaluated separately and in combination for the prophylaxis of respiratory illness in Navy recruits. The period of study included the Asian influenza epidemic of October, 1957.

A relative reduction in febrile (and/or hospitalized) respiratory illnesses of 68 per cent was associated with the inoculation of both vaccines. Relative reductions of 60 per cent and 28 per cent were associated with the inoculations of influenza virus vaccine and adenovirus vaccine, respectively. The relative reductions are based entirely on reported illness and clinical observations.

The data indicate that the evaluation of one vaccine with unrelated infection of both the test and control group being suppressed by another specific vaccine fails to provide a more clearly defined evaluation of the test vaccine when both types of illness are prominently prevalent.

In this study, the evaluation of one vaccine was not rendered more critical when both test and control groups were also given vaccine protection against a prevalent unrelated illness.

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Journals Wanted

The Association has received several requests for the January, 1958, and January and February, 1959, Journals from persons who bind the magazines. These persons and the Association would be grateful if members having no use for these particular issues would make them available to others. Such generosity will be much appreciated. The magazines should be sent to the Association office at 1790 Broadway.

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Journal of Public Health

EDITORIALS

The Word, the Thought, the Deed

In the beginning was the Word—For without the Word there would be no transmission of thought, and without thought we could not be human. But we speak not of a Platonic Logos. We speak of the human word, derived from experience and expressed in action, the word which makes homo faber and homo sapiens one.

From the earliest times, men have had to concern themselves with the health problems of the groups to which they belonged. As they learned to deal with such matters, the accumulated experience and ideas were perpetuated orally. Knowledge was transmitted by word of mouth from teacher to pupil. With the invention of graphic means for recording experience and ideas, whether by clay tablet, papyrus, or parchment, the spoken word was joined by the written word. And the written word became the book, the most useful tool over the past two millennia for recording and preserving the experience of the past for the use of the future.

When the printing press was invented, making easier the transmission of health knowledge, it gradually created an ocean of reading matter in which many fear we shall drown. Yet we must remain readers, for the printed word remains the most important single vehicle for the transmission of experience and thought. Reading is needed to illuminate, if possible, the problems with which we are currently concerned, or perhaps to direct attention to matters that have been overlooked. William Osler summed up the matter succinctly when he said: "To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all."

From a professional point of view, then, we read to learn, to improve ourselves, to enrich our minds, and to make our activities more effective and more meaningful. However, much of what we read for these ends is factual and contemporaneous. Facts are all that many books and periodicals offer us, and facts are in many ways very inferior intellectual nourishment. The more facts accumulate the greater grows the desire to have done with such bits and pieces, and we create a mood for a more generalized view that will bring order into our perceptions. We turn to philosophy which, as Diotima, the mysterious priestess of Mantinea, put it in Plato's "Symposium," is most appropriate for those who are neither all-knowing nor totally ignorant. But philosophies are of a time and a place.

They formulate the thought of a people, of a group, under conditions which may have been very different from those that now prevail. For this reason we must also see these matters from a historical point of view. A study of contemporary life and problems without historical and philosophic foundations will necessarily remain superficial and in large measure meaningless or irrelevant.

The bookshelf article in this issue is intended to help the reader who wishes to explore the larger view of public health. On one point, however, we should be clear. None of us comes devoid of all experience, notions, and preconceptions, and as a result our responses are likely to differ. For this reason, we have followed the maxim laid down by Virginia Woolf: "The only advice, indeed, that one person can give another about reading is to take no advice, to follow your own instincts, to use your own reason, to come to your own conclusions. If this is agreed between us, then I feel at liberty to put forward a few ideas and suggestions because you will not allow them to fetter that independence which is the most important quality that a reader can possess."

Cooperation Is a Two-Way Street

SEWAGE CONTAMINATION of the water supply of institutions served by septic tanks is of infrequent occurrence, but the hazard is potentially present and contamination may occur when those cleaning such tanks are not alert to the dangers involved. Just such an event occurred at a school in Alabama in the fall of 1958.[1] A pitcher of water drawn from the tap gave off a foul odor and exhibited a brown color, alerting teachers and pupils to the fact that something was amiss with the school water supply. Several hours later, the local health department was notified, further use of the water was banned, and action was taken to remedy the situation.

An investigation revealed the source of pollution—a cross-connection between the public water supply and a tank truck cleaning the school septic tank. Preventive measures were taken. These included immunization of all pupils against typhoid fever and poliomyelitis, alerting of physicians to the possibility of an unusual frequency of disease, as well as a request for immediate reporting of any increased incidence.

The nature of the cross-connection was found to be a temporary connection between the water distribution system in the school and the pump on the truck cleaning the septic tank. Auxiliary water was needed to prime the pump in the truck and also to circulate through the pump for cooling purposes. On the day the incident occurred, a substitute pump operator failed to close the valve between the water system and the pump on completion of priming. This allowed some of the pumpage to be forced back into the water system at times when heavy use of water in the school lowered the normal pressure in the water lines.

As soon as the source of pollution was known, appropriate measures were taken to cleanse the entire system until bacteriological tests showed the water to be safe again. The town officials, having been warned of the potential danger, increased the normal chlorine residual in the entire community supply. Happily, no cases of typhoid fever, dysentery, infectious hepatitis, poliomyelitis, or meningitis had been reported from the general area for the six months preceding the incident; nor were any reported for the following six months. The only unusual manifestations of disease were six very mild cases of diarrhea of short duration and undetermined etiology.

Yet clouds do have silver linings and accidents can be studied to determine the nature of the causative factors and what can be done to prevent a repetition of the occurrence. The incident described above again emphasizes that water supply and waste disposal remain in the forefront of public health concerns. It reemphasizes the significance of immunization both for routine prophylaxis and in the possible prevention of cases following use of a polluted water supply. Most significant of all is the proof that this event offers of the value of a trained staff, including engineering personnel, in the health department.

At the same time, it also calls to mind a factor that is frequently missing, partly or completely, in community health work, namely, cooperation. The report of the incident does not indicate the character of the relationship between the departments of education and health. All too often official departments go their own way paying little attention to the services available through other official agencies. A county ordinance required the licensing by the county health department of all operators who cleaned septic tanks. This did not extend to the activities of other departments of government. It seems fatuous to suggest that the department of education should have called upon the health department at least for advice and counseling. Equally unnecessary, it is hoped, is the suggestion that even where the health department has no legal responsibility it should offer its services to other branches of government. The Alabama community where the incident occurred might have had many scars left. An alert, competent health department, good communication and cooperation, ex post facto, between the two governmental agencies involved, combined to minimize a situation fraught with dire potentialities. The dangers of the situation might have been obviated by more preventive cooperation.

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1960 Is the Golden Anniversary Volume
of the American Journal of Public Health

To the Editor:

This letter was stimulated by Dr. V. Terrill Davis' letter in the September, 1959, A.J.P.H. His comments concerned the increased medical attention given to the over-all human needs of individual patients in dealing with more specific aspects of the human physiology.

Judging from recent experiences of parents an area of neglect is the medical-social situation that encompasses circumcision. Some parents and physicians probably insist on the operation for male infants for different reasons, others may not care, and still others are opposed to it. A pertinent English study of health and illness in children concludes that when the frequency that circumcision is performed is remembered, the reasons given are "curiously lacking in precision." Postoperative complications that occurred in 12 (or 22 per cent) of the circumcised group included excessive hemorrhage in four children and infection in five children. But perhaps this is only part of the picture.

Only a research approach can satisfactorily come to terms with the basic premise that any rationale for surgery should be subject to review. I suggest that medical-social research might uncover informative, if not important, factual material. For example, could we learn from asking who if any one, initiates the discussion about circumcision? Prospective parent? Prenatal clinic physician or public health nurse? Private obstetrician? Family physician? Who considers the operation important and why? Do expectant mothers in labor sign a consent form given them by a clerk across a counter at the point of hospital admission? Do they know what they are signing? Do nurses say it should be done if they happen to notice it hasn't when the parents prepare to take the infant home? Are there different policies in different hospitals and why?

These kinds of questions are raised because it is well known that the operation is overladen with religious complexities rather than faced with human simplicity. However, to discuss this or to raise questions almost becomes abnormal and the questioner himself is suspect. Are not attitudes terribly important?

One may question whether circumcision is appropriate for discussion in a health journal, especially when less and less attention appears to be given this practice and there appear to be far more important matters to attend to. However, since answers are lacking concerning the importance of basic functions, what is demanded is more knowledge from a disinterested and research view. This is especially true when the effect of circumcision on the human organism is scant and clouded by an emotional over-lay. The use of your Letter to the Editor column is requested to share these thoughts with other health workers. I might add that I am in accord with the medical practice, mental health, and public health implications of Dr. Davis' letter.

Louis Hochberg,
Social Work Consultant,
Department of Public
Health, Berkeley, Calif.

REPORT OF THE CHAIRMAN OF THE EXECUTIVE BOARD OF THE AMERICAN PUBLIC HEALTH ASSOCIATION TO THE GOVERNING COUNCIL 1958-1959

Part I—General Introduction

EACH YEAR it becomes more difficult to believe that the intervals between Annual Reports are constant rather than diminishing. It is not necessary to explain this phenomenon to the Governing Council. Three years now have passed since the Arden House Conference. Its recommendations have been reviewed critically and thoroughly by the membership of the Association and the Governing Council has effected those changes which it felt were meet and proper. The Standing Committees and Program Area Committees have adapted to change in structure and function. There has been substantial, if not completely satisfactory, progress in the financial status of the Association and activity has increased to the same degree. Our major concern, now that the neonatal period of our rebirth has been negotiated, is to retain the momentum we have achieved and, to mix a metaphor in keeping with the times, to gain orbit rather than to fall back into the sea of inertia and inaction.

There is both necessity and assurance that this will be the case. With your permission, I should like to discuss this statement very briefly as Part I of my report, submitting as Part II, for the archives of the Association and the later thoughtful reading of the membership, those vital data of the Association's year considered essential and traditional for the continuing record.

There is urgent necessity that the Association endure and grow stronger in the years ahead. It must become a mature, competent, modern force in this, our present society. At the end of the sixth decade of the twentieth century of this era, man lives in an increasingly complex, a persistently hostile world. As his knowledge increases, so does his obligation to use it properly to grow stronger. As successes are gained, the time of his tribulation extends. There is so much yet to learn, so many things more to do—about surviving in this darkening gloom of radioactive environment, polluted air, ensewaged water, contaminated foods, toxic occupations, and viral infections; about living productively and happily in greater crowds, at greater speeds, with more enduring handicaps.

There is radiant assurance that our Association still has more future than past as we measure the distances we have gone in three short years from Arden House and the enthusiasms that have attended the journey. To be sure there have been Cassandra-whispers of brief revival and imminent relapse, but these are lost beneath the sounds of bustle as augmented and devoted staff work with the hundreds of dedicated and enthusiastic committee members to take us onward.

The crowded, industrialized, aging substance of our problem; the thin ranks of public health manpower to solve it; the unaware public, absorbed in expenditure for rockets and chrome; this is a wearily familiar picture, often painted. And what is the unique gift which this Association brings to the problem which makes its continued growth so important?

In your chairman's view it lies paradoxically in the very fact of an organizational problem which worries so many of us now—the problem of relationships and the development of symbiosis between sections and committees. Nowhere else to my knowledge exists the dual advantage of the APHA: on the one hand the specialized knowledge of each Section's membership, so largely homogeneous; on the other hand the synthesis of specialties and the formulation of multifaceted viewpoint of the Association committees.

When we can perfect a mutually acceptable and successful mechanism by which Sections and committees can fulfill their own distinct destinies while preserving the fecundity of their union, the Association's role of leadership will be apparent.

Uniting the levels of government, the member professions, the official and voluntary, the specialty programs, APHA will yearly come more completely into its own as the forum where ideas may be shaped and balances gained by citizens of all persuasions possessing only the common attribute of allegiance to public health.

Part II—Report of APHA Activities of the Past Year

The three years since the Arden House Conference in 1956 have seen progress in each of the three divisions into which the staff functions of the Association have been divided to accomplish the intent of the conference report. As I indicated last year, these are:

1. Association Development
2. Program Development
3. Public Policy and Education Activities

1. Association Development

The Washington Office and the Western Regional Office were established just prior to the 1958 Annual Meeting; both are now operating smoothly. The activities of the former, which relate primarily to legislation, I shall discuss later in the section on Public Policy and Legislation. In addition to legislative activities, it has been possible for the director of the Washington Office to attend a number of affiliated society meetings within the Southern Branch.

The first year of activity in the Western Regional Office has been devoted to physical establishment of the office and to creating working relationships with the various Affiliated Societies of the West. Our director took part in the annual meetings of nine associations. A good share of time was devoted to planning for the 1959 Western Branch meeting in San Francisco, with resulting side effects of significance for the future—working relationships have already been instituted with planning groups for the 1960 and 1961 meetings in Denver and San Diego. A scheme has been developed to schedule overlapping state annual meetings so that a team of outstanding nationally renowned speakers can be brought into the region for appearances on successive days in several states. The regional director has secured a modest commitment from one foundation for this purpose and is seeking additional funds.

A full-time program has been established for continuing education in public health to serve the 13 Western states. This program with financial and staff support from the University of California School of Public Health and under the auspices of the APHA, has a full-time director, Donald Hufhines, M.P.H. This is not a complete list of the accomplishments of the branch but it demonstrates what regional offices can do—even in a short space of time. Would that we were able to finance more of them!

In the home office a significant improvement in office management efficiency and strengthened program con-

tent can be expected as a result of the purchase of equipment for the Professional Examination Service. After a year's negotiation, the Association has a commitment with IBM to rent a 407 accounting machine and additional equipment which will modernize the operations of the Professional Examination Service. This will give the research program of the PES much greater flexibility in its manipulations. The equipment will also be used by our membership unit and will facilitate billing as well as make possible biennial membership directories.

Financing the Association continues to be a problem. The three-year general grants from the Rockefeller Foundation and the W. K. Kellogg Foundation will continue through next year. A systematic approach to initiating Agency Memberships to supplement our core income has been initiated. The first group to be offered such an affiliation will be state health departments—early in 1960.

Income from individual memberships has stayed up but has not increased markedly. For this reason, the president-elect is initiating a massive campaign for increased membership through stimulation of action by all Sections.

We have had from the Russell Sage Foundation a small grant to extend to the field our project on utilization of behavioral science in public health practice. During the year we secured from the Federal Office of Vocational Rehabilitation a grant for the development of tests for vocational rehabilitation personnel. Funds are needed for additional special purposes such as publication, financing plans of projected special endeavors in program areas such as disaster problems, alcoholism, and medical care administration.

Far too little support has come from industrial sources through private Sustaining Memberships. To broaden the base of Association support, a Finance Committee is being appointed by the Board to survey the entire financial picture.

We have had some staff changes, as you know. Dr. Edward Press resigned August 1 to become health commissioner of Evanston, Ill. Miss Martha Luginbuhl, research associate, resigned June 1. On the other side of the ledger we have the appointment on April 1 of Samuel M. Goodman, Ph.D., as director of research and statistics for the Professional Examination Service.

2. Program Development

The Technical Development Board has continued its multifaceted task of "initiating and assisting in the development of balanced activities by the Association in all aspects of the public health program." Cognizant of the fact that it draws its strength from the members and will function best if it truly represents them, and the members identify with the Board, the Program Area Committees, their activities and plans, special efforts have been made to relate to the members through the medium of the various Sections. Last year this centered on appearance of Board members in meetings of Section Councils; this year Section representatives are invited to a meeting of the Board. Elements in the chairman's report especially urge membership participation in defining research needs, development of standards, and methods of evaluation.

Among the Board's active interests during the year have been definition of the Association's role in alcoholism, medical care administration, community surveys and self studies, health services in disaster; and the development of a conceptual document on the broadened spectrum of health and morbidity along with others to be reported in detail by the chairman. Several publications are in development by Program Area Committees and most of these will be issued during the coming year. A

second National Conference on Evaluation is being planned.

Policies relating to community surveys have been redefined and a committee, advisory to staff and the Association, has been appointed. Utilization of skilled public health persons from various parts of the country as community consultants on call are among the plans to revitalize and extend the Association's survey activities. Community surveys continue to be a valuable service offered by the Association. A major community health survey was carried out during the year in Bridgeport, Connecticut. It covered both the public health and mental health needs of the community. A number of consultations were carried out on community surveys by the deputy executive director and the director of field services.

Looking toward the desirability of continuing leadership in the development of international relationships the Executive Board at its last meeting authorized the appointment of an ad hoc committee to whom this responsibility will be assigned. The Executive Board also continued its endeavor to streamline Governing Council routine so as to provide more opportunity for deliberation on policy matters. The elimination of a verbal roll call at Council meetings is to be continued; there will be no committee reports read, as all will be distributed in summary form before the meeting, but an opportunity will be provided for discussion of interesting developments by the chairmen who have been invited to present such matters personally to the Council.

A number of these special interest areas have been noted on your advance agenda of this meeting.

The working committees of the Sections have been particularly busy this year. One, that on Vital and Health Statistics Monographs, has secured a special grant for its activities from the Rockefeller Foundation.

An attempt has been made by the staff to increase our working opportunities with related professional organizations such as the national medical, dental, engineering, and nursing groups; the social welfare groups; and the organizations representing graduate and undergraduate teaching of public health.

A special effort is being made to fill in gaps in Association policy where no Council action has been taken recently. A number of resolutions will be presented as well as a number of policy statements for consideration by the Council on matters which are significant in today's health pattern. It is hoped that a comprehensive statement of Association position will thus be made possible.

3. *Public Policy and Education Activities*

Like the establishment of the Western Regional Office, the opening of the Washington Office in September, 1958, marked a big step forward. With the guidance of the Executive Board and the Public Policy and Legislation Committee, and under the supervision of the Executive Director, the Washington Office has moved forward very effectively. Procedures have been established to keep the membership informed of proposed legislation which had a direct or indirect effect upon health. Public Policy and Legislation Committee members review all such bills, report their opinions on the advisability of APHA action and the position to be taken, and suggest competent witnesses.

With Affiliated Societies and Branches the Washington Office has developed a modus operandi for informing each of pending legislation and the dates for effective action. This paves the way for getting to each member of Congress views and opinions from a recognized health authority in his own state. Liaison with appropriate branches of the federal government has been well worked

out. Similarly the Washington representative has made his services available to members of Congress and their committee staffs. The APHA position on various specific health problems has thus been made available.

Dr. Troupin as director of professional education for the Association has extended the activities of the Committee on Professional Education in a number of ways—most significant perhaps is that of establishing a central clearing house on student census at all of the graduate schools of public health. A similar mechanism has established a continuing review of the faculty and facilities in all of the graduate schools on an annual basis rather than the former triennial inspection for accreditation. The director of professional education is also working closely with professional accreditation boards and the various professional schools teaching public health and preventive medicine.

The Professional Examination Service has continued to expand and has maintained its high standards of service. The Committee on Professional Education, recognizing the very complex and specialized services of this branch of APHA, has established a special subcommittee to work with Dr. Long and report to the CPE. Dr. George James is chairman of the subcommittee which will include representatives of the testing field outside of public health as well as various public health disciplines.

A number of policy matters will come to the Council's attention by way of resolutions at the second session. Several other matters of moment to the Association will be brought to the Council's attention by committee reports. The Board wishes to bring to the Council's attention still another door through which ideas enter under study of the Association's deliberative bodies. A number of suggestions have come, from one source or another, to the Board directly. Of these, the Board has listed in an Appendix to this report certain ideas as appearing to merit close study which may ultimately bring them to consideration of the Council for action. For some on this list, this has already happened through other channels. For those which have not had this consideration, the Board proposes, with such guidance as the Council now might wish to give the Board, to refer these items to the appropriate committee for study.

The Executive Board has also reviewed three resolutions referred to it by the Governing Council. In considering implementation of the 1955 and 1956 resolutions on racial discrimination the Board decided to request from its state affiliates an analysis of the situation with respect to the integration of public health staff and services. The inquiry will cover not only the present situation but also progress since 1950, prospects for the predictable future, and obstacles within and outside the jurisdiction of health departments which militate against complete integration.

The second resolution referred by the Governing Council to the Board for action was one on population problems and planned parenthood which was presented at the Annual Meeting in 1958. As requested by the Council, a committee was appointed which has prepared a draft statement which at this time is being circulated and commented on by interested groups.

The third resolution referred to the Board by the Council related to one paragraph struck by the Resolutions Committee from a resolution on the support of nonprofit nursing homes. In this instance the Board voted to direct the Program Area Committee on Chronic Disease and Rehabilitation to work with the committee of the American Public Welfare Association on this subject. This brings to a close my report of the major activities of the Association,

the breadth and scope of which grow apace. The detailed accounts you will find and be gratified by in the impressive reports of the Technical Development Board and the Standing Committees.

JOHN D. PORTERFIELD, M.D.
Chairman

APPENDIX*

That state health departments develop research units in chronic disease epidemiology, and that a federal program of support for such units be instituted.

That state health departments develop local demonstrations of various types of services for chronic disease and aging, and that a federal program of support for such state programs be instituted.

That state and local health departments promote or develop comprehensive home care programs for the chronically ill, including nursing care, physical and occupational therapy, medical social work, x-ray and laboratory service, housekeeper service, transportation, sickroom equipment, supplies and appliances, and that a federal program of support for such programs be instituted.

That the administration of all public health and medical programs—including medical care for the needy and the operation of public general hospitals—be the responsibility of health departments.

That state health departments establish programs of state aid to universities for regional postgraduate education programs for physicians and other health personnel, and similar aid to hospital councils for regional coordination of hospitals, and that a program of federal assistance to state health departments for such programs be instituted.

That federal, state, and local financial support for public health services be increased substantially to enable state and local health departments to meet the new public health needs in the fields of chronic disease and aging, mental health, medical care, and control of environmental hazards such as radiation and atmospheric pollution, while fulfilling properly the old needs.

That state governments appoint qualified career public health physicians as state health commissioners.

* Ideas suggested for further study and possible future action by the Governing Council.

Dr. Porterfield is Deputy Surgeon General, Public Health Service, Department of Health, Education, and Welfare, Washington, D. C.

Report of the chairman to the Governing Council, October 18, 1959, at the Eighty-Seventh Annual Meeting in Atlantic City, N. J.

REPORT OF THE CHAIRMAN OF THE TECHNICAL DEVELOPMENT BOARD TO THE GOVERNING COUNCIL 1958-1959

ATTENTION is drawn to the first formal report of the Technical Development Board to the Governing Council as containing much material which is useful for orientation regarding the Board's make-up, its responsibilities, and methods of working. The report this year is written as a supplement and an extension of the 1957-1958 report (A.J.P.H. 49, 1:96-112, Jan., 1959).

The Board and its members have a pervading sense that its achievements are dependent on continuing strong relationships with the members of the Association through the Sections and with the members of Affiliated Societies through the Committee on Affiliated Societies and Regional Branches. The Board can best carry out its function of advising, stimulating, and developing a lively, meaningful, well coordinated professional program for the Association only with the help of the membership. We are still experimenting to find the best ways to fulfill this cogent wish and need through provision of easy channels of communication. During the 1958 Annual Meeting members of the Board met with Section Councils to summarize and interpret the work of the Technical Development Board and to get an expression of the wishes and desires of the members as expressed through the Sections. During the 1959 Annual Meeting Sections and members have been invited to attend a hearing of the Board and to put forward their ideas about the adequacy of the professional program of the Association; the Board, its functions, and its relationship to other units of the Association.

The Board has filled its function of coordination increasingly well, not alone through provision for interchange of information but by bringing about increased collaboration between Program Area Committees and Standing Committees; for example, on agreement of the two chairmen, a Subcommittee on Community Health Surveys has been transferred from the Committee on Evaluation and Standards to the Program Area Committee on Public Health Administration.

The Board and the Program Area Committees have set several new wheels turning during the year. Members will find many interesting subjects in the reports of the committees included at the end of this report, and scrutiny is invited. These reports give only a small indication of the great amount of thought, reflection, debate, and labor by the dedicated committees, chairmen and members.

Long-Range Program

Progress on 1958 Proposals

The Technical Development Board, in meeting its constitutional responsibility for "initiating and assisting in the development of balanced activities by the APHA in all aspects of the public health program," proposed several lines of action at the 1958 meeting of the Association. These included: (1) Greater emphasis on research leading to elevation of standards and improvement in practice. Progress on this is anticipated as a result of the proposed joint Conference on Evaluation. (2) Reconsideration of the geographic and administrative basis for local public health

organization in view of population trends and other factors. This is under active consideration by the Subcommittee on Local Health Services of the Program Area Committee on Public Health Administration. (3) A new approach to medical care as a significant element in public health. Action on this is to be found in the statement on the Public Health Role in Medical Care and the proposed Association program put forward by the Program Area Committee on Medical Care Administration and approved by the Technical Development Board and Executive Board (Supplements I and II). Believing that the Association should develop additional statements interpreting and clarifying those already developed by the Program Area Committee on Medical Care Administration, the Board recommended to the Governing Council adoption of the following as a statement of Association policy:

"—That state and local health departments promote the development of coordinated, comprehensive community health and medical care programs;

—That federal technical assistance and financial aid for such programs be expanded;

—That community programs of this kind be designed to coordinate activities for all segments of the population, including those who can themselves pay for such services and to provide services for those at special risk because of their disadvantageous health, socioeconomic and cultural conditions;

—That such programs provide for continuity of patient care including progressive patient care in hospitals and other institutions and at home;

—That home care programs, as well as institutional care programs, include physicians' services, nursing care, medical social work, physical and occupational therapy, homemaker service, x-ray and laboratory service, transportation service, sick-room equipment, supplies and appliances."

(4) Increased alertness of the Association to imminent events affecting the public health. The staff of the Association and the Program Area Committees on Child Health and Chronic Disease and Rehabilitation are actively preparing for the White House Conferences on Children and Youth and on Aging. (5) Attention to the broadened spectrum of health and morbidity.

A report of a work party on this subject is in preparation and a final report is hoped for in 1960.

These selected examples well illustrate the fact that the Association has taken steps along each of the lines of action suggested at the time of the 1958 Annual Meeting.

Changes in Our Way of Life and Their Effect on People

In keeping with its responsibility, the Technical Development Board has this same year been giving further attention to the development of a long-range professional program for the Association. This attention has focused particularly on the need to study ways of life as a basis for understanding health and how to improve it. Not only do mortality and morbidity deserve consideration in public health planning; so also do the patterns of life which underlie health and disease. The rapidity of change in mode of life during the mid-twentieth century undoubtedly carries profound biosocial significance, as yet little understood. Great alterations are taking place in diet, in the air we breathe—both by community air pollution and by cigarette smoking, in amounts of physical exertion, in social and emotional stress, and in many other aspects of daily living.

Scientific evidence is already beginning to accumulate that certain features of modern life are responsible for much disability and premature death, e.g., cigarette smoking. Because the diseases that arise from such new elements in the personal and community environment are generally chronic in nature and insidious in onset, harmful effects may be taking place among millions of people before their relationship to the condi-

tions of life is recognized. The problems confronting public health in respect to conditions such as cancer, heart disease, and mental illness are thus different from earlier problems such as acute enteric infections, different particularly in the length of time between exposure to causative factors and onset of illness.

It is therefore urgent that investigation be pressed into the now rapidly changing ways of life so that we may avoid long-term adverse effects from seemingly harmless new aspects of the physical, social, psychological, and cultural environment. Such investigation should aim to determine as precisely as possible the specific features of daily living—food eaten, air contaminants breathed, types of work and leisure, the houses and neighborhoods where families live, personal relationships—which advance or interfere with health.

It is well recognized that public health problems and the promotion of public health is not a concern of professional health workers alone, but that of the entire population, with numerous groups of people not usually thought of as belonging to the health professions making plans and doing things which have tremendous impact on the health of the people. Thus it must be assumed finally that there is public responsibility for changing the conditions of life, and the public health profession must concern itself with any resulting impact on the total health of people.

Housing and Community Development

The housing facilities in which families live and the groupings of families and houses that we call neighborhoods are today in a constant state of change. Often the community planning that precedes change gives too little consideration to the social, cultural, and physical needs of families and the aging. Too little attention is given to the problems of human relations, to surroundings suitable for rearing children, or handling the impelling drives of adolescents.

Federal, state and local governments are now undertaking many programs which affect housing, and large numbers of people are involved. These programs include local planning and zoning; establishment and enforcement of standards for physical safety, sanitation, and comfort; urban renewal and rural development; public subsidy for construction of housing; loans of public funds for private housing; and other aspects of the total housing problem. These governmental efforts carry profound implications for total health. Many times one or another project is undertaken without an adequate framework of community-wide planning. When urban renewal or rural development are being planned, it is necessary to consider not only the physical housing itself—important as this may be—but also the uprooting and reestablishment of families; the human problems created when nuclear families are separated from extended families and neighborhood friendship groups; the racial, cultural and socioeconomic milieu of the old and new neighborhoods and their effect on total health; the age of the population or the income level of families for whom housing projects are planned; the organization of health and medical and other services for people moving into new housing; and many more health aspects of the rapid changes which are now being promoted by public effort.

For example—the maintenance of ethnic and economic barriers in neighborhood or housing developments by means of explicit or implicit public policy may promote or prolong social stress and provoke severe behavior disturbances among youth. The conditions of a "West Side Story" are already only too typical of Los Angeles and Detroit as well as New York.

The public health profession recognizes increasingly the need for giving attention to the effect on health—physi-

cal, mental and social—of the housing and neighborhood environments in which people live. It is necessary to develop methods for studying these problems in their specific details and for applying available knowledge toward improving situations which are harmful to the total health of the people.

A Subcommittee on Housing and Health has been established (reconstituted from the former Committee on the Hygiene of Housing) and placed in the Program Area Committee on Environmental Health. It will undertake research and studies of the current trends in housing and community development and will seek the incorporation of health and social principles into such development. In order that this new subcommittee will be in a position to look broadly at the whole question and at its many facets the Technical Development Board has recommended that the membership include persons representing the following interests: psychology, social anthropology, city planning, urban renewal, architecture, child life, safety engineering, public health administration, nursing, social work.

Broadened Spectrum of Health and Morbidity

The Board has further developed the concept of a broadened spectrum of health and morbidity mentioned in the last annual report through the device of a Work Party, chaired by Dr. Samuel M. Wishik. During the coming year it is expected that a report will be prepared by this Work Party. Already from previews given to the Board it is apparent that it will be thought-provoking and will indicate not only the importance of some common health problems which have received inadequate attention, but also the need for increased keenness in our tools for detection of minor deviations from health and from a healthful environment.

Research Program for the Association

Prompted in part by the last two annual reports of the Committee on Research Policy and summarizations of topics currently under discussion as presented by the chairman, the Association's research program was discussed in sessions of the Board with a sense of urgent need for the Association and its various units to meet on a broad scale their responsibilities in fostering and encouraging research and in certain instances by carrying out basic, applied and methodological research. As a simple working definition the Board considered research as a series of planned activities to answer one or more questions, the answers to which are not available and the results of which usually have general application. The discussions were replete with illustrations, for example, basic studies of atherosclerosis, the respiratory and enteroviruses, nutrition (including overnutrition) and other basic problems in epidemiology, social, and behavioral sciences.

Similarly, in the applied research area questions were asked such as: Why has not polio vaccine reached all the susceptible population? Why are there pockets of unprotected persons with resultant tragic local epidemics? Soon there will be an effective measles preventive: How can it be managed so that its full potential effectiveness in preventing death and disability will be felt as rapidly as the vaccine becomes available? Why have the technics of conservation and reclamation of water and solid organic wastes been ignored when they furnish solution to some of the most urgent and costly problems faced by some communities (i.e., sewage, garbage and waste disposal)? How can we fill our role of identifying and reaching with definitive programs the unreached and multiproblem families?

Methodological research (utilizing the basic knowledge and skills of the social

scientists, among others) is required to reveal the best methods for applying new technical knowledge and avoiding the tragedy of delay. As better methods are found, public health people must not procrastinate but assume their full responsibility and move vigorously for full use and application.

Among the many suggestions for APHA activities in the promotion and implementation of sound research were the following:

1. Delineate clearly areas of public health in which further research (basic and applied) is feasible and needed.

2. Stimulate and sponsor research by:
—bringing to the attention of competent research workers or academic institutions questions for research, especially applied research constructed to validate hypotheses or answer questions;
—identifying factors, methods and principles essential for research of high quality;
—assisting in development of administrative patterns favorable to research, especially in the social sciences as related to health (community field research laboratories).

3. Stimulate and encourage research training, both academic and inservice, in all of the disciplines basic to the health of the people, and work to improve the training of public health personnel in research methodology and research design.

4. Give assistance to scientists and to academic and operational organizations by:
—helping to develop valid research designs;
—discovering sources of financial assistance;
—serving as fiscal agent;
—helping to prepare proper applications for funds.

5. Undertake cooperatively with academic and/or operational organizations pilot studies or "production runs" to develop new methods of operation or to test out the applicability to public health practice of existing knowledge not generally being applied as well as newer knowledge becoming available in many related fields.

The Board believes specific studies should be directed toward determination of characteristics of populations, to longitudinal studies of cohorts, to development of indexes of total health, to determination of the components of "good community health" and methods of measurement.

6. Promote and sponsor seminars and conferences on research at which there may be exchange of ideas and infusion of enthusiasm and interest. At the Annual Meeting a general scientific session should be devoted to the reporting of a research effort, with prompt publication of the report in the Journal.

7. Influence and aid in the development of local, state, national and international policy in support of research.

8. Serve as a source of current information for referral of inquiries on:
—research that has been done in the public health field, either basic or applied, or other research that has a bearing on public health in the biological, social, physical, and chemical sciences;
—similar research that is going on;
—areas of public health needing further research;
—sources of financial aid to research.

9. Act as a catalyzer in public health research:
—making more readily available the results of research which have possible application to public health;
—coordinate and disseminate the results of demonstrations, field trials, "production runs";
—reevaluate the reports of some past research which had been shelved to estimate the value in the light of current problems.

10. Cooperate with other organizations, government, voluntary agencies, and foundations in improving our national effort in basic research through establishment of conditions more favorable to its continued growth.

Several units of the Association have begun to explore research needs in particular areas of interest. These include delineations by the School Health Section, Laboratory Section, Engineering and Sanitation Section, the Program Area Committee on Public Health Administration. During the past year a Work Party has developed a statement of need for research in public health nursing.

The Technical Development Board urges all Standing and Program Area Committees and Sections to explore the important and unanswered questions in their area of interest, determine the feasibility of proposed research and seek ways and means for its implementation.

Field Surveys

APHA field survey activities have been revised in keeping with recommendations made by the Board, includ-

ing preparation of several working documents and appointment of a Field Survey Advisory Committee to the staff and the Association.

It is recommended that the Association with this committee and knowledgeable consultants increase its consultation and survey activities and hence its impact on public health planning and programing.

Health Services in Disaster

A Work Party on Health Services in Disaster, chaired by Dr. Ira V. Hiscock, met during the year and made its recommendations for an Association program. This report outlined in considerable detail roles which the Association might undertake. The Technical Development Board amended the report of the Work Party and gave emphasis to natural or civil disasters. Consideration of thermonuclear war disaster was dealt with separately.

I. Natural or Civil Disaster

1. It is recommended that the APHA assume an active, imaginative, and bold role in developing its unique contributions for improvement of health and medical services in natural or civil disaster.

2. It is recommended that an appropriate unit be established and membership be appointed at an early date and charged with fulfillment of the functions described as well as such further exploration, planning, and execution of services as need and opportunity indicate.

3. It is recommended as a matter of urgency that full-time staff be obtained to assist the appropriate Association unit. It is believed insufficient to the need and otherwise undesirable to have staff carry this job in addition to other duties.

4. It is recommended that funds to defray the costs of the proposed committee and staff be sought from government agencies, private foundations and other sources.

II. Thermonuclear War Disaster

It is recommended that the aforementioned appropriate unit designated to work on natural disaster be given the added responsibility of:

—continually examining the state of available technical knowledge concerning the protection of life and health from thermonuclear warfare.

—from time to time recommending that the APHA take actions which they believe will contribute effectively to the improvement of planning for the protection of the health of the people in the event of thermonuclear warfare.

The recommendation for establishment of an appropriate unit was transmitted to the Executive Board, who authorized the establishment of a new Program Area Committee on Health Services in Disaster.

Alcoholism

A Work Party on Alcoholism, chaired by Dr. John Philp, reported to the Board and, after discussion, the Board, in response to the report, agreed in recognizing that the problem of chronic alcoholism is of such magnitude that it has become one of the major public health problems in the United States, and that the APHA, representing health workers of many disciplines, is an appropriate organization to assume national leadership in the field.

Therefore the Board recommends that the APHA extend its resources and seriously undertake action in this important aspect of public health; specifically that it (1) declare its intention to provide a focal organization point at which workers in this field can study and develop programs; (2) establish a subcommittee under the Program Area Committee on Chronic Disease and Rehabilitation with representatives from the Program Area Committees on Mental Health and Medical Care serving as direct liaison; (3) establish suitable relationships with other organizations working in the field; (4) conduct a membership campaign among persons now engaged in alcoholism work; and (5) urge Sections of the Association to welcome these persons and make provision for their professional development.

Highlights of Program Area Committee Activities

Accident Prevention Committee

A book tentatively to be titled "Accident Prevention—Policies and Concepts" is in preparation. It will function as a

teaching aid. Publication is hoped for by 1960.

A resolution favoring full-time directors of accident prevention programs in state health departments has been submitted to the Committee on Resolutions.

The committee has cooperated actively with the Public Health Service and National Safety Council in the development of educational materials regarding plastic bags, seat belts, and wringer injuries.

A report on current practices in the teaching and training of accident prevention in medical schools has been compiled and made available to schools.

Child Health Committee

Three additional guides for services for children are nearly completed, covering heart disease and rheumatic fever, emotional disturbances, and orthopedic handicaps.

An advisory board is reviewing "Health Supervision of Young Children."

An informal survey has been made of health department participation in state level planning for the White House Conference on Children and Youth.

A joint working group for the evaluation and planning of maternal and child health services has been formed with the Maternal and Child Health Section of APHA and the Association of State Maternal and Child Health and Crippled Children's Directors.

A study design for nation-wide survey of state and local health services for mothers and children is in preparation.

An authoritative statement on tuberculin testing of children through high school age is being prepared as a guide for public health workers.

Chronic Disease and Rehabilitation Committee

"Chronic Disease and Rehabilitation—A Program Guide for State and Local Health Agencies" to be completed for publication late in 1959.

Resolutions were prepared for Association consideration on the following: problems of aging, development of rehabilitation services in health departments, relationship of smoking and lung cancer.

Joint action was initiated with the National Heart Institute and the American Heart Association to prepare a statement for guidance in prevention of coronary and cerebral thrombosis.

Plans for Association participation in the White House Conference on Aging are under active consideration.

Environmental Health Committee

Established a proposed basis for environmental health programs based on four areas and four levels of concern and is reviewing the status of working knowledge and proper practices relating to environmental health in regard to air, water, food, shelter, and manpower.

A new Subcommittee on Housing and Health is being formed (replacing the Committee on Evaluation and Standards Subcommittee on Hygiene of Housing).

Progress was made on revision of the Sanitation Evaluation Schedule.

A statement on "Environmental Concerns with Radiation" was prepared and submitted to the Technical Development Board and Program Area Committee on Radiological Health with a recommendation that certain health aspects of radiation be carried forward by this committee.

Joint action was initiated with other groups on problems relating to approval of proprietary devices, noise as a public health problem, the administrative placement of an air pollution program, and control of the sanitary production of milk.

Medical Care Administration Committee

A statement on the "Public Health Role in Medical Care" was developed as a basis for planning an Association program on medical care administration. This statement was approved by the

Technical Development Board and Executive Board, and adopted with amendments by the Governing Council. (See Supplement I.)

"A Prospectus for a Medical Care Program for the APHA" was developed, proposing a small full-time staff to initiate a series of studies within the Association and to stimulate studies by others. The prospectus was approved in principle by the Technical Development Board and Executive Board, and efforts to obtain financial support for the proposed program are in progress. (See Supplement II.)

Publication of the statement, "Disability—Cash Benefits Versus Rehabilitation?" (A.J.P.H. 49:1082-1084 (Aug.), 1959) was recommended.

The Dental Health Section was urged to develop a handbook on prepaid dental care.

Mental Health Committee

Continued progress was made in preparing a manuscript for "A Guide to Control Methods for Mental Disorders." Pending completion of this document, the committee is holding other efforts in abeyance.

Public Health Administration Committee

A "Guide to a Community Health Study" was completed for field testing.

Planning was initiated for a second National Conference on Evaluation for September, 1960, under the joint auspices of APHA and the University of Michigan School of Public Health.

The manual on "Administration of Community Health Services" being prepared under a grant from the International City Managers' Association will be ready for publication in 1960.

A statement on "Needs for Research in Public Health Practice" was completed and forwarded to the TDB.

A "Glossary on Uniform Terminology in Evaluation" was completed.

Revision of the APHA "Guide to Medical and Public Health Nursing Supervision of Tuberculosis Cases and Contacts" was begun.

A Subcommittee on Control of Chemical Poisoning was appointed.

A study of state health department councils is continuing.

A study of the geographic and administrative basis for community health services is under way jointly with the National Health Council, Public Health Service and the Association of State and Territorial Health Officers.

Radiological Health Committee

The APHA suggested model acts for radiological health are being revised.

The statement on "Public Health Policy on Radiological Health" is being revised.

The Association's Executive Board was advised on action to be taken relative to pending bills in Congress to emphasize essential responsibility of health departments for protection of the public from radiological hazards.

Action was initiated to encourage development of training courses for radiological health personnel.

Development of a factual pamphlet on radiological hazards for use by the general public was recommended.

A code on minimum requirements for installation and operation of x-ray units is being drafted.

It was agreed that the Committee on Environmental Health should take responsibility for developing standards and recommendations relating to monitoring the environment and its various components for radiological hazards.

MARTHA M. ELIOT, M.D.
Chairman

Report of the Chairman to the Governing Council at the Eighty-Seventh Annual Meeting of the American Public Health Association in Atlantic City, N. J., October 18, 1959.

PUBLIC HEALTH ROLE IN MEDICAL CARE*—Supplement I

THE OFFICIAL public health department is the principal agency charged legally with the protection of the health of the community as a whole. It should (1) exercise leadership and set patterns which will insure high quality of care in all endeavors concerned with the maintenance and promotion of health, the prevention and treatment of disease and disability and rehabilitation for all segments of the population, and (2) provide medical care for those groups of individuals for whom it is given specific responsibility, either by legislative action or through agreement with other bodies. The extent of public health department participation in medical care will vary from community to community, but it must be recognized that the demand for the provision of such care by the official health agency is increasing.

Traditionally, public health agencies have sought to fulfill such obligations by clarifying the nature and magnitude of health problems, by bringing the resources of the community to bear on such problems, by maintaining standards through regulations, by demonstration, education and evaluation, and in some states by providing actual medical care when it is not otherwise available to the individual.

Many categorical approaches have been developed and administration divided among a multiplicity of groups, organizations and agencies. The provision of modern comprehensive medical care is complex and costly. Continuity of care in the home, in the hospital, or in other institutions is necessary. Inadequacy in any one of the areas of service may work to the detriment of another and may lead to unnecessary or inappropriate utilization of facilities and inefficient use of funds.

Departments of health can and should make available to members of the health professions and to others providing medical services, technical advice and assistance as well as specialized personnel such as public health nurses, nutritionists, and physical therapists. The department should also make available to individuals and consumer groups advice and help in evaluating medical care and developing health service programs.

A number of diseases such as cancer, heart disease, mental illnesses, diabetes, and dental caries are increasing in public health prominence. In cooperation with other groups and with the advice and assistance of the health professions, health departments should participate in the provision of such medical care services as are necessary to improve the control of these diseases.

Public health agencies through specialized disciplines such as epidemiology and biostatistics are developing new concepts and methods in research, planning, and evaluation of medical care developments. The promotion of high quality care for all members of the community should be a particular concern of the health department. This may be accomplished by establishing high standards for those programs for which it is directly responsible and by

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This statement was adopted by the Governing Council on October 21, 1959.

* The term "medical care" as used in this statement refers to all types of personal health services and care of the sick or disabled by physicians, nurses, dentists and other health professions whether provided through hospitals, clinics, or other community programs administered by public or private agencies or through the medium of private practice.

working with other agencies in the community, such as professional societies, organized medical care groups, hospitals, and related institutions to develop means of appraising the quality of care and assessing the impact of various programs and methods of financing on the health of the community.

The health department has inescapable responsibility for promoting the maximum application of prevention in all medical care activities. In prevention lies a potential major area of progress in solving increasingly difficult problems of medical care.

Local and state governments, with and without federal assistance, are assuming greater responsibility for providing medical care which would otherwise be unavailable or for which persons or families are unable to pay. Because of medically and other specially trained personnel on their staffs the health departments are the logical and appropriate agencies of government for planning, developing, and administering programs of medical care. In some states such responsibilities are not possible of achievement at the present time because of constitutional or legal provisions. Under such circumstances, joint programs can be arranged by contractual agreements. The decision as to whether or not a health department will be given responsibility for the administration of such programs should be left to the discretion of each state or local government. Under any circumstances the health department should participate in an over-all plan for a coordinated program. This would help correct duplication, overlapping and gaps in the continuity of the program regardless of which agency has the major responsibility. Any federally-sponsored and supported programs should clearly give to the states (governors or legislatures) the right to designate the responsible state agency and to this end federal laws should be amended and federal regulations revised. While in some states there might be legal barriers to designating state health departments, when this is not so the state health agency should be given primary consideration for this health responsibility.

In summary, public health departments have an obligation and an unusual opportunity in the field of medical care. This is especially true in the prevention of disease and disability. Whether or not the public health agency participates in or actually administers medical care services, it should exert leadership in setting standards, in promoting quality and efficient use of resources through health education, demonstration and research.

PROSPECTUS FOR A MEDICAL CARE PROGRAM FOR THE AMERICAN PUBLIC HEALTH ASSOCIATION*—Supplement II

Statement of Problem

THE AMERICAN PUBLIC HEALTH ASSOCIATION has as its foremost objective the protection and promotion of personal and public health. In devotion to this objective, its members have recognized that a large variety of persons and a considerable scope of services, both private and public, contribute to this goal. One of the most important factors is the quantity and quality of medical care. The public health role is described in Supplement I.

Fulfillment of this role is increasingly complex and important as a result of a very rapid increase in population, regrouping of population in age distribution, occupation, and geographically. New knowledge has developed at a rapid pace under the impetus of accelerated research, with attendant increasing risk of a longer and longer lag between the discovery of new knowledge and its beneficial application. Greater public demand for good medical care arises from increasing consciousness of potential health improvement available through good care. This demand and interest are increased as the public reads and reflects on the abundant journalistic articles about medical care and medical advances, and becomes better able to judge the quality of medical care.

The American Public Health Association, in attempting to carry out its role in protecting and promoting health through improvement of medical care, has asked itself five basic questions about significant facets of medical care:

1. How much medical care is actually being received as compared with a standard of quantity, particularly by groups at special risk?
2. To what extent does medical care meet desirable standards of quality?
3. What is the impact of the specific medical services and patterns of medical care upon the health of individuals?
4. What is the community-wide effect of the services and patterns of medical care?
5. Is vigorous research being performed to discover the factors influencing the quantity, quality, and effectiveness of medical services to individuals and to communities, and to determine the promptness with which new knowledge is applied for human betterment?

Competence of the APHA

This is the only multiprofessional national association of all types of trained people engaged or interested in the protection and promotion of personal and public health. It is a membership agency with members drawn predominantly from the only agencies with a legal obligation to protect and promote the health of the people. There are approximately 13,000 members with a total of 25,000 members in affiliated societies and regional branches. The membership is drawn from many professions and represents no single vested narrow interest. These public health workers possess a distinctive intellectual skill which they practice habitually, to wit, thinking effectively in terms of population problems and effects, and of functioning as practicing ecologists in finding ways to beneficially affect the physical, mental and social well-being of persons through understanding and actions related to the total environment, both inanimate and animate.

* Prepared by the Committee on Medical Care Administration and approved in principle by the Executive Board on June 29, 1959.

History of Actions Relating to Medical Care

The Association's interest and actions in medical care and its relationship to health have been shown in a number of significant ways:

1. Formation in 1944 by the Committee on Administrative Practice of a Subcommittee on Medical Care. This subcommittee had a grant from the Rockefeller Foundation for the employment of staff and produced a number of significant papers. However, the subcommittee and its operation were not as integral a part of the Association as is the Committee on Medical Care Administration.

2. Establishment of a membership unit, the Medical Care Section, as an Association "home" for the growing number of members with a central interest in medical care and its relationships to public health. Many papers given at meetings of this Section have been published in the American Journal of Public Health.

3. An increasing interest and concern for medical care is shown in the adoption of certain resolutions by the Governing Council of the Association:

Raising quality of medical care furnished through organized programs and plans.

Paid-up insurance for aged persons.

4. In a reorganization and revitalization of the Association in 1957 eight multidisciplinary professional program committees were established. One of these is the Committee on Medical Care Administration, and closely related ones are the Committee on Chronic Disease and Rehabilitation, the Committee on Mental Health and the Committee on Child Health. These committees are integral parts of the Association structure.

5. Other Association activities of note include:

Joint committee with the American Public Welfare Association to define the role of public agencies in health care of the aged.

Joint committee with the American Hospital Association to revise a statement on coordination of health departments and hospitals.

Interassociation committee on health with the American Medical Association, American Nurses' Association, American Public Welfare Association, American Dental Association, and American Hospital Association.

While the Association regards its previous activities as significant, it now believes approaches previously used are far too limited and have failed to use the resources and unique organizational pattern of the Association to fullest advantage. The Association is in a position to act in behalf of the health of the people in making careful studies as described in the proposals below; to embark on activities for education of the public to make optimum use of medical care facilities and procedures. Other functions for which the Association is uniquely qualified is the performance, stipulation, or collation of research on medical care subjects of interest to public health, and pulling together the interest, viewpoints, and resources of other health professions. The belief is held that the time has come when the Association can make further significant contributions, acting through the medium of the Committe on Medical Care Administration.

The Committee on Medical Care Administration includes among its members persons with a variety of professional skills and experiences. This committee is one of the professional program area committees of the Association, operating under the general aegis and supervision of the Technical Development Board, which provides in its membership a great depth and breadth of professional competence and experience.

The committee has had several meetings and has developed a proposed work program. However, its members, while generously devoting time to this committee, are otherwise employed. With the addition of staff, the committee believes it could act in concert with

the rest of the Association in developing new knowledge and making new meaningful contributions rather than being limited, as at present to discursive actions. The proposed work program shown below is divided into two phases. Phase I are the projects which can be undertaken and completed within the Association and by the basic staff which is proposed. Phase II are the projects which would be stimulated by the staff; special project funds would be sought separately; many of the projects would be carried out in other than Association settings (schools of public health, health departments, and so forth). When completed, the work reports would be reviewed by the Committee on Medical Care Administration, by other professional units of the Association, and in matters affecting policy by the Governing Council of the Association.

Proposal

It is proposed that the committee operate as a fact-finding and study arm of the Association on problems relating to medical care. It is anticipated that from time to time the results of studies under the aegis of this committee may be utilized as the basis for determination of Association policy, although it is recognized that other units of the Association carry major responsibility for policy determination. In addition to the specific work proposals given below, the committee would attempt to extend the interassociation and interprofessional activities of many professional organizations interested in facets of medical care and would attempt to harmonize the concerns of other professional organizations working in this field.

Phase I—Work Projects Undertaken by Proposed Staff

1. Compilation and evaluation of the legal basis for regulation and medical care in the various states: (a) professions, (b) licensure of places rendering care, (c) administrative bodies for medical care programs.
2. Study of accrediting bodies privately administered: (a) Joint Commission on Accreditation, (b) specialty boards, (c) admission to hospital staffs, (d) hospital staff procedures, (e) medical society committees.
3. Study of health professions—manpower, its utilization, conservation and adequacy; the assembly and critical analysis of those studies relating to shortages and production.
4. Study current developments in health department administration of medical care programs.

Phase II—Work Stimulated, Collated by Staff, Performed by Others with Separate Financing

1. Study of medicare: evaluation administratively and qualitatively.
2. Study of hard to reach groups.
3. Quality of care in health departments; evaluation, technics of evaluation.
4. Impact on health of medical care process.
5. Content of medical education.
6. Study of programing, organization, quality, efficiency and effectiveness of various organized and unorganized means of providing medical care.
7. Study use of nonmedical technics for health improvement.

Since these studies are regarded as significant and important ones and since the Association is unable to pursue them adequately through group action alone, it is seeking funds in behalf of the committee sufficient to employ a small staff to work for an extended period of time under the guidance of the committee. Findings will be embodied in reports and the consensus of professional judgment of members of the committee and members of the Technical Development Board will be added to the factual materials. It is planned that the committee with the staff will stimulate and aid others in research design, and will take certain studies on its own behalf, but it is not anticipated that funds for extramural research programs will be disbursed by the Association.

ASSOCIATION NEWS

APHA ANNUAL MEETINGS

1960—October 31-November 4—San Francisco, Calif.
1961—November 13-November 17—Detroit, Mich.

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. The purpose of Fellowship is to recognize in each field a superior professional stature and performance. Criteria for selecting the individual are by comparison within his own public health specialty. As of January 1, 1960, the total membership of the Association was 12,693, including 3,508 Fellows, or 27.6 per cent of the total.

Questions are frequently asked regarding the requirements for Fellowship and the following statement outlines the provisions of the current By-Laws governing qualification and election.

Professional public health workers who have been members of the Association for at least two years, and who are of established professional standing in the field of public health, either employed by public or private organizations, or in independent private practice, are eligible for election as Fellows, upon their own initiative or upon invitation issued by the Council of the Section with which they are affiliated, or by the Executive Board acting in place of the Section Council when they are not affiliated with a Section. Persons in the following categories are considered to have an established professional standing in public health for this purpose:

(a) A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health or other equivalent degrees, according to standards approved by the Executive Board.

(b) A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

(c) A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

(d) A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

(e) A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs (b) and (d) that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

(f) A person not covered by the above, who has made substantial contributions to public health work in his chosen branch and who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank

from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Applications are accepted up to August 1 each year for consideration by the Governing Council at the fall meeting. It is important to make clear that members themselves should take the initiative in submitting such application. Although several thousand persons have been elected to Fellowship since 1922, there are other persons well qualified who have never initiated the process. Members should not await action by others if they wish to attain Fellowship. It is proper for them to take the first step.

An application for Fellowship must include the names of five references, at least two of whom are Fellows of the Section with which affiliation is desired. The APHA office will assist, on request, in determining the Section with which prospective references are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship should include the names of any two Fellows of the Association among the five references.

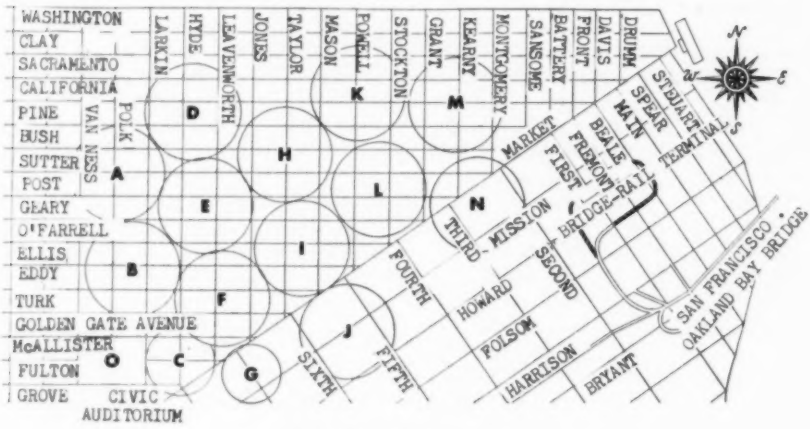
When properly completed, the application is sent to the APHA office. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 14 Sections, plus a chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-Laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or of one of the Sections, chairman of an Association or Section Committee (over one hundred in number), or of the Technical Development Board, a member of one of the seven Standing Committees, a member of the Governing Council or Executive Board. Some Civil Service and merit system records depend upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $20 annually and include a subscription to the American Journal of Public Health and other services to which members are eligible. Life membership is available at $200 covering all future annual dues.

Applications for Fellowship to be considered at the 88th Annual Meeting in San Francisco, Calif., October 31-November 4, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information address the Membership Department, American Public Health Association.

Street Plan of San Francisco Showing Location of Civic Auditorium and Housing Bureau Hotels (Letter indicates Zone)



HOTELS AND RATES

Zone	Hotel	Single	Double	Twin Beds	Parlor Suite
E	Alexander Hamilton	$10.00–14.50	$13.00–18.50	$13.00–18.50	$20.00–60.00
H	Bellevue	8.00–10.00	10.00–12.00	12.00–15.00	20.00–25.00
L	Beresford	4.75– 5.50	6.00– 6.75	6.50– 7.00	
M	Beverly Plaza	7.00– 8.00	10.00–11.00	10.00–12.00	20.00–
A	Broadmoor	7.00–	8.00–	10.00–	
I	Californian	8.50–11.00	10.50–13.50	11.50–14.00	22.00–25.00
H	Canterbury	10.00–17.00	12.00–19.00	14.00–20.00	25.00–40.00
L	Cartwright	6.50–	7.50–	8.50–	
H	Cecil	7.50– 8.50	9.50–10.50	11.00–12.00	
L	Chancellor	7.00–	9.00–	10.00–	
H	Clift	13.00–21.00		16.00–23.00	41.00–50.00
K	Colonial	8.00–12.00	12.00–15.00	15.00–20.00	20.00–25.00
H	Commodore	6.00–12.00	8.00–14.00	10.00–16.00	
L	Devonshire	6.00– 6.50	7.50– 8.50	8.50–10.00	
L	Drake Wiltshire	10.00–11.00	12.00–14.00	15.00–16.00	25.00–35.00
H	El Cortez	8.00–10.00	10.00–12.00	11.00–14.00	20.00–26.00
F	Federal	3.00– 5.50	4.00– 7.00	4.50– 7.00	
L	Fielding	6.00– 8.00	8.00–10.00	9.00–12.00	20.00–25.00
L	Franciscan	7.00–	9.00–	12.00–	18.00–
H	Gaylord	8.00–	10.00–	12.00–	25.00–
L	Golden State	5.00– 6.00	7.00– 8.00	8.50– 9.00	
K	Grant	5.50–	8.00–	9.00–	
A	Jack Tar	10.00–20.00	12.00–22.00	16.00–26.00	32.00–80.00
L	King George	6.00– 8.00	8.00–10.00	10.00–14.00	20.00–
J	Lankershim	4.00– 5.50	5.00– 7.00	6.50– 8.00	
F	La Salle	6.00–	7.00–	8.00–	15.00–
A	Leland	4.00– 6.50	5.00– 8.50	7.00–10.00	
L	Manx	8.00–11.00	10.00–12.00	11.00–13.00	20.00–25.00
K	Mark Hopkins	15.00–19.00	19.00–23.00	19.00–23.00	38.00–75.00
H	Maurice	6.00– 9.00	8.50–10.50	9.00–11.50	17.50–18.50
I	Olympic	5.50– 8.50	7.50–11.00	8.50–10.00	
I	Oxford	7.00– 8.00	8.00– 9.00	9.00–10.00	
L	Paisley	5.00–	6.50–	7.00–	
J	Pickwick	5.00– 7.00	6.00– 9.00	6.00– 9.00	
L	Plaza	7.50–11.50	9.50–13.50	10.00–14.50	18.00–20.00
L	St. Francis	12.00–22.00	13.00–20.00	16.00–25.00	30.00–55.00
B	Senate	5.00– 6.00	6.00– 7.50	7.50– 9.00	
N	Sheraton Palace	8.75–16.50	13.85–20.50	13.85–20.50	25.00–150.00
L	Sir Francis Drake	11.00–16.00	13.00–17.00	16.00–22.00	35.00–50.00
L	Stewart	7.00–12.00	9.00–14.00	11.00–18.00	26.00–30.00
N	Sutter	5.00– 7.00	7.00– 9.00	8.00–10.00	
C	Whitcomb	10.00–12.00	11.00–16.00	12.00–16.00	25.00–60.00
H	Worth	7.00–	8.00–	9.00–	

SAN FRANCISCO ANNUAL MEETING, OCTOBER 31-NOVEMBER 4

A Housing Bureau will be operated by the San Francisco Convention and Visitors Bureau for the Association. Since all requests for rooms are handled in **chronological order,** it is recommended that you send in your application as quickly as possible.

In making hotel reservations please use the blank below, indicating your first, second, and third choice of hotels listed. Because of the limited number of **Single Rooms Available,** you will have a better choice of securing accommodations in the hotel you prefer if your request calls for rooms to be occupied by two or more persons. Rates quoted are for the room, and in case of double occupancy, the rate will be shared.

No Minimum Rates, or any specific rate within the full price range quoted, can be guaranteed when your reservation is confirmed. Hotels make every effort to give you the requested rate. However, this is governed by prior check-outs and availability of such rooms on the date of your arrival.

All Requests Should Be Accompanied by a Deposit Check for $10 per room made out to the **APHA Housing Bureau.** Hotels cancel unclaimed reservations by 4:00 p.m. Therefore, a deposit is requested to insure that your reservations will be held on your arrival date—whatever the hour. Your deposit will be credited to your account. **Please Do Not Send Cash.**

Cancellations: Cancellations must be received 15 days prior to the meeting for refunds of your deposit to be made by the hotel.

Late Requests: Applications Received Later Than October 16 (15 days prior to the opening date of the convention) **will be returned.** In such cases please select your own hotels and write to them direct.

All reservations must clear through the Housing Bureau. All requests must give definite date and approximate hour of arrival and names and addresses of all persons who will occupy rooms requested.

ALL RESERVATIONS WILL BE CONFIRMED IF REQUEST IS RECEIVED NOT LATER THAN OCTOBER 16.

MAIL TO:

APHA HOUSING BUREAU
Room 300, 61 Grove Street
San Francisco 2, California

(*Note:* Single rooms are very scarce. Please arrange to share a twin-bedroom with another.)

PLEASE MAKE RESERVATIONS NOTED BELOW:

First Choice Hotel .....

Second Choice Hotel .....

Third Choice Hotel .....

Single Room .....

Double Bedroom .....

Twin Bedroom .....

Parlor, Bedroom Suite .....

Arrival ..... at ..... A.M. ..... P.M. Departure .....

NAMES OF ALL OCCUPANTS:
(Please bracket those sharing a room)

ADDRESSES:

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Check For $..... payable to **APHA Housing Bureau** is enclosed. Please enclose a self-addressed stamped envelope.

MAIL CONFIRMATION TO: (Signed) .....
(Please print or type)

Address .....

City ..... Zone ..... State .....

CLEARING HOUSE—SALARIES, PERSONNEL NEEDS

An Example of Valuable Cooperation

All the California counties, except the two most populous, are working together with the State Department of Social Welfare to develop a single common examination program for the beginning level of social work positions. Thus an applicant who takes this examination may become eligible for employment in any of the participating counties. The common examination does not preclude varying standards in the counties as to education, experience, and qualifications, or in fact the minimum qualifying score in the examination. More of this kind of state-wide cooperation might help to relieve the tightness of the clerical market.

Manpower: Health and Science

The Public Health Service's "Health Manpower Source Book" in Section 9 brings up to date the story on physicians, dentists, and nurses. In the more than a quarter of a century since 1931 the ratio of physicians (not in federal service) has increased only about one and one-half per 100,000 population, but has actually decreased since 1940. In a 90-year period for which figures are shown for 27 different years the highest ratio was in 1880 with 163 total physicians per 100,000 population, the lowest in 1929 with 125. It is clear from the figures that the supply of physicians is not keeping up with the growth of population.

The quarter century has seen a marked increase in physicians in federal and in hospital service and practicing full time in a specialty.

Since 1920 there has been a considerable increase in the ratio of dentists to population but with a slight drop since the 1940 peak. The ratio of nurses has increased by more than 50 per cent since 1930.

This volume of 79 pages is available from the Government Printing Office at 50 cents.

"Scientific Manpower, 1958" by the National Science Foundation contains the papers of the seventh conference on scientific manpower which was a symposium on demographic and sociological aspects of scientific manpower. The emphasis is on scientists and engineers rather than health scientists but the factors affecting the supply of intellectuals, for example, for professional training, the role of the professions in American life, and other subjects have much of relevance for the consumer of health manpower—and indeed—for those joining the health manpower ranks.

The employment and other characteristics of the nearly 116,000 scientists appearing in the 1954-1955 national register of scientific and technical personnel are described in another National Science Foundation publication of 1959, "American Science Manpower" (NSF 59-39). In this group fewer than 1,000 were reported employed in the medical sciences but the number of physicians in the life sciences—agricultural, biological, and medical—represented nearly one-fourth of all those employed in these sciences.

Each of the two latter documents are also available from the Government Printing Office. No information as to cost.

Educating Medical Technologists

"To broaden the scope and increase the potential of medical technologist and cytotechnologist education" is the

stated purpose of a new three-year pilot study supported by the Cancer Control Program of the Public Health Service. Sponsored by the National Committee for Careers in Medical Technology with headquarters in the University of Alabama Medical School, the project will "thoroughly diagnose, treat, and hopefully make stronger and better" the 11 approved schools of medical technology in the state. It is hoped to learn how to improve the quality of medical technology training in Alabama and thus guide the same thing elsewhere; to plan for including cytotechnology in medical technology training; and to stimulate graduates to broaden their training.

A state advisory committee is made up of representatives of the state health department, the medical society, and related organizations. In addition there is a national educational advisory committee headed by Ruth Hovde, associate professor and director of medical technology, University of Minnesota Medical School. A pathologist committee is headed by Lall G. Montgomery, M.D., chairman of the Board of Registry of Medical Technologists. William I. Christopher, director of personnel services, Catholic Hospital Association, is consultant to the project.

Salaries of Public Health Nurses

For those who want information on 1959 salaries of public health nurses in local public health nursing services they will find it in the December, 1959, issue of Nursing Outlook, National League for Nursing. In brief, charts, tables, and text, 1958 and 1959 salaries in official health units, nonofficial agencies, and boards of education are compared. For each type of agency and each position classification there has been an increase both in the median annual salary and in the range of middle 50 per cent of salaries.

Among the data included is a table of median salaries for the five years ending 1959. Percentage increases range from 11 per cent for nurse directors of local official health units to 27 per cent for staff nurses of boards of education. Although the median salaries of nurse directors in nonofficial agencies have increased 20 per cent, they are still 10 per cent below the directors in official agencies. Supervising and staff nurse salary medians have increased from 20 to 23 per cent. Median salaries of supervising nurses, the highest rank among board of education nurses, are higher than those of nurse directors in nonofficial agencies and almost equal to those in official health units.

Reprints of this article (R-100 is the code number) are available from National League for Nursing, 10 Columbus Circle, New York 19; 15 cents.

California Government Careers

The California State Personnel Board has prepared "Careers in California State Government" in order to give the state's teachers, counselors, and placement officials in "their important guidance work . . . a better understanding of the part that state services take in our daily lives." Here, with text and pictures, are described in brief summary some 2,000 positions in 34 different state agencies. For each of the agencies there is a list of beginning level positions.

The main section of the book describing each agency is evidently designed chiefly for guidance to the high school student, who is to be, for lack of a more definitive term, a nonprofessional worker with the minimum of specialist training. A second section, which specifically excludes the field of medicine, is devoted to careers for college graduates. Here the classifications selected are "those which offer the best opportunities for career growth and advancement." But in neither section of the report is there

any indication that medicine, nursing, or veterinary medicine are professions with opportunities in the departments of public health and of mental hygiene. The subtitle "A Guide to Selected Occupations" may be the clue.

California State Personnel Board, Sacramento. No information as to out-of-state distribution.

Hospital's Teaching Responsibility

"A contribution to the future" is the description of the teaching responsibility at University Hospitals of Cleveland. In "Progress for Better Health" is the story of how a social work trainee learned her profession working with and helping a family on the road back to self-sufficiency. As a by-product of helping the hospital's public to understand its manifold duties, this little pamphlet is also a good recruitment piece—for social workers, but also for interns, residents, dietetic interns, practical nurses, x-ray technicians, medical technologists, administrative residents, and medical stenographers, of whom more than 300 annually come to the institution (affiliated with Western Reserve University) for specific hospital programs.

"Progress for Better Health" is No. 4 in a series describing the work of the hospitals. University Hospitals of Cleveland, University Circle.

Health Careers Exchange

The second issue of "Health Careers Exchange" is out. This occasional newsletter of the National Health Careers Program of the National Health Council is designed to inform and stimulate those organizations and persons who are carrying on or are interested in carrying on health careers programs.

The new issue has a fairly extensive round-up of some of the varied health careers activities going on around the country. Although the distribution of the Exchange is limited, as indicated in the current issue's editorial, single copies are available to those who need help in developing a health careers program. Those who have reported such a program in being or in planning receive the Exchange automatically. 1790 Broadway, New York 19, N. Y.

1959 Health Careers Round-up

The Commission on Health Careers has published its second Health Careers Round-Up—for 1959. This round-up describes 150 health careers projects for which reports were received among the approximately 500 known to be in existence.

Involved in the projects reported on were the state health departments of 34 states; a wide variety of other agencies—local health associations, tuberculosis, heart, and cancer associations, medical society women's auxiliaries, health councils, and many others. This variety gives color to the "teamwork and action" emphasized in the introduction.

You may request the full National Health Council report if you are active in health careers or recruitment planning. National Health Council, 1790 Broadway, New York 19. As a sample of the kind of information to be found in this document are two states whose material found its way to the editor of Clearing House.

The Florida State Board of Health devoted the December issue of Florida Health Notes to careers in public health. An educational piece which definitely keeps an uninitiated audience in mind in its writing approach, it could act as a worthy guide to other groups planning this kind of publication. There are no apologetics here; the publication succeeds in showing that career opportunities in public health are worth looking into. Selected illustrations are reproduced with permission from Health Careers Guidebook published by the National

Health Council with the public interest support of the Equitable Life Assurance Society.

Further north—the Health Personnel Program of the Virginia Council on Health and Medical Care grew out of a 1957 conference on "The Shortage of Nurses and other Hospital Personnel." This group has been following up on the activities of the National Health Council recruitment program by placing "Career Kits" in private and public secondary and junior high schools in the state with pamphlets on the various health disciplines. The council has a traveling exhibit for a school and has recently published a brochure "Hey! About to Choose a Profession?" and a new booklet "Health Career Opportunities in Virginia." This council also concerns itself with the economic status and utilization of health personnel. Further information from Edgar J. Fisher, Jr., director, 100 East Franklin St., Richmond 19.

Humanism and Medicine

From its beginnings, medicine has evolved as an art based on moral and aesthetic principles, pursuing the knowledge of man as a whole being, both in his physical and spiritual aspects, to assist him in health and disease. As the scientific phase of medicine developed, knowledge of human nature was deepened and the scope of medicine was enlarged. The good physician serves mankind with generosity, sensitivity, and kindness. Medicine is thus, in essence, humanism—understanding man in historical perspective and social evolution, surrounded as he is by an ever-changing environment. With these objectives, medicine today is both a biological and a social science bearing directly on all the complexities of society, including man's beliefs, traditions, ideas, and ways of living.

World Health for World Peace, November, 1959.

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

SOCIETY AND SECRETARY

ALABAMA PUBLIC HEALTH ASSOCIATION, Ralph Roberts, State Health Dept., Montgomery
ARIZONA PUBLIC HEALTH ASSOCIATION, J. Rex James, Maricopa County Health Dept., Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Mrs. Joan Davis, City Health Dept., San Jose
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Dorothea Hansen, City Health Dept., Los Angeles 12
COLORADO PUBLIC HEALTH ASSOCIATION, Alice de Bruyn Kops, 4660 S. Delaware, Englewood
CONNECTICUT PUBLIC HEALTH ASSOCIATION, Shirley Thayer, R.N., 61 Arnold Way, West Hartford 7
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 511 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Everett H. Williams, Jr., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Carl Fox, 33 Pryor St., N.E., Atlanta
HAWAII PUBLIC HEALTH ASSOCIATION, Alison MacBride, R.N., 510 S. Beretania St., Honolulu 13
IDAHO PUBLIC HEALTH ASSOCIATION, Charles Hammond, P. O. Box 640, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Malcolm J. McLelland, State Board of Health, Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Lloyd Coe, Iowa Hospital Association, 1012 Liberty Bldg., Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, W. W. Willmore, Kansas Tuberculosis and Health Assn., 1134 Topeka Ave., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Peggy Fisher, 620 S. Third St., Louisville 2
LOUISIANA PUBLIC HEALTH ASSOCIATION, Lucille Godeffer, State Dept. of Health, New Orleans 7
MARYLAND PUBLIC HEALTH ASSOCIATION, Mary Thompson, Prince Georges County Board of Education, Upper Marlboro
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Marjorie Delevan, 1817 West St. Joseph Street, Lansing
MINNESOTA PUBLIC HEALTH ASSOCIATION, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Thomas S. Willett, Montana Public Health District 1, Hardin
NEBRASKA PUBLIC HEALTH ASSOCIATION, George R. Underwood, M.D., 935 R. St., Lincoln, Neb.
NEW JERSEY PUBLIC HEALTH ASSOCIATION, Waldo McNutt, M.P.H., Delaware River Drive, Frenchtown
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Daniel T. Marley, P. O. Box 8066, Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Frances Ann McVey, 4317 Robinson St., Flushing 55, N. Y.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mrs. Kathleen Boland, Rensselaer County Health Dept., Troy
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Robert W. Brown, Box 7525, Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice H. Peterson, M.D., State Dept. of Health, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Mrs. June O'Donnell, 3516 Braddock St., Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Bill Burk, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Muriel David, City Bureau of Health, 203 N.E. 28th Ave., Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Mae de Acin, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Laura M. DeMarse, State Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Katherine Brandon, M.D., P. O. Box 25, Foothill Station, Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Helen W. Wiesmann, 1220 E. Broad St., Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Caesar Branchini, General Electric Company, Richland
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Katherine L. Brown, West Virginia State Dept. of Health, Charleston 5
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, 1 W. Wilson St., Madison
MIDDLE STATES BRANCH, APHA, Thelma Luther, Dept. of Health, Des Moines, Iowa
SOUTHERN BRANCH, APHA, Guy Tate, Jr., Jefferson County Health Dept., Birmingham, Ala.
WESTERN BRANCH, APHA, Robert G. Beaumier, 1309 Smith Tower, Seattle, Wash.

Florida Publishes a History

Affiliated Societies and Regional Branches thinking of publishing the year-by-year story of their organization from founding to date will want to take more than a lingering glance at the 36-page mimeographed and bound document, "History of the Florida Public Health Association," recently issued.

The author, May Pynchon (former president of FPHA) ties in the organization of the FPHA with "the beginning of a movement which has had a definite impact on the health" of Floridians. Making the most of scant historical records, she succeeds in giving substance to the story of what Florida's public health workers and FPHA members owe to their predecessors, beginning with B. L. Arms, M.D., state health officer from 1925-1929, who started serious efforts toward an FPHA.

"The founding of such a body was

not so simple as it would seem" the author says, and points out that we moderns should not take such groups and their pioneering efforts for granted. Originally the name of FPHA was borne by a statewide voluntary agency affiliated with the National Tuberculosis Association. After two years of discussions, this organization agreed to relinquish its title in March, 1931, to the public health workers who wished to form a professional society in the state. Meanwhile the group which became the new FPHA had met for their "first annual conference" in 1929, and organized themselves at their 1930 meeting. The history carries FPHA up to 1956.

A limited number of copies of this edition may possibly be available. A printed edition will be issued "sometime in the future." Secretary of FPHA is Everett H. Williams, Jr., P. O. Box 210, Jacksonville 1, Fla.

PHANYC: The National Health Survey

Health personnel who attended the Public Health Association of New York City's January 18th meeting were provided with a wealth of information about the National Health Survey which was authorized by Congress in 1956. First speaker, Paul M. Densen, D.Sc., deputy commissioner of health, New York City Department of Health, described how the survey accumulates information on a continuous basis through household interviews: on illnesses, impairments, accidents, and injuries to persons; on their utilization of health facilities; and on other health-related topics. Public and private agencies, increasingly concerned with the prevention, detection and control of chronic illness, and with the need for rehabilitation services, will find the data of great value in planning their programs. To point to but a few of the other uses for the information the survey is collecting: voluntary hospital and medical insurance plans will be able to use the morbidity data, combined with demographic facts as the actuarial basis for their operations; manufacturers of drugs and appliances now have a basis for estimating potential markets for new products.

The survey's mobile examination units (exhibited at the 1959 APHA Annual Meeting) are used for providing specific physical examinations for members of some households included in the survey. The examinations serve as a means for checking the validity of data acquired through interviews. The examinations also secure basic physiological measurements on a representative sample of the population; this has never been done before. Dr. Densen noted that various studies on the methodology of the survey will be made.

Abraham Lilienfeld, M.D., professor and director of the Division of Chronic Diseases, Johns Hopkins School of Hygiene and Public Health, spoke on the uses of the National Health Survey data in epidemiologic studies. Citing details of epidemiologic studies of breast cancer and the relationship of cigarette smoking to lung cancer, Dr. Lilienfeld predicted that the survey will serve as the basis for many other studies relating disease patterns to demographic factors which influence them.

Frank Van Dyke, assistant professor of administrative medicine, Columbia University School of Public Health and Administrative Medicine, a director of the university's state-sponsored study of hospital prepayment in New York State, posed some of the questions which that study is designed to answer: Why do some plans provide for lower benefits than others? Is 21 days of hospital insurance adequate for older persons? What are the hospital utilization patterns of different groups? Those responsible either for planning and administering or for regulating prepayment plans and health insurance need to learn the answers to such questions on a continuing

basis if they are to promote more adequate methods of financing health care. The National Health Survey is an excellent and flexible administrative mechanism for the continual gathering of hitherto unknown but important health insurance data for the use of local and regional planners, tailoring itself as it can to discovering local needs in various parts of the country, as the Columbia study has done in New York State.

George James, M.D., first deputy commissioner, New York City Department of Health, chaired the meeting.

Hawaii's Eye on November 1960

The "big talk" at the annual meeting, November 10, 1959, of the Hawaii Public Health Association is the forthcoming "Pan Pacific Health Conference" November 7-12, 1960, in Honolulu, jointly sponsored by HPHA and APHA. The report is that HPHA members are "quite excited at the prospect of a lively public health conference and the opportunity to share Hawaiian hospitality with our colleagues from far and near."

HPHA passed several resolutions at its meeting which reflect the Association's broad health concerns:

1. Ratified the action of the Executive Committee, which had set forth reasons why the new state's government should have independent departments of health and welfare. (The original reorganization bill had called for one combined department; however, the final act separated health and welfare.)
2. Requested the Department of Education to implement the new School Health Curriculum Guide with staff and sufficient funds.
3. Asked the governor and Legislature to create a permanent Commission on Aging.
4. Urged Hawaii's United States senators and representatives to retain the cancer clause in the food additives amendment.
5. Requested that the governor and Legislature retain present minimum qualifications for director of health in the new government.

The program featured six papers on local research in health, a panel on work evaluation in rehabilitation and a look at public health behind the Iron Curtain with a public health psychiatrist who had been there.

Dr. Max Levine was the outgoing president. Officers for 1960 are:

President—Royce Higa, executive secretary, Tuberculosis Association, County of Hawaii
Vice-President—Sam Goo
Treasurer—David A. Bowers, executive director, Tuberculosis and Health Association, Honolulu.

Communications Theme in Oregon

The program of the annual meeting of the Oregon Public Health Association (November 3-5, 1959, in Eugene) began with a panel discussion on the conference theme, "Communications — Approaches to Selling Public Health to Ourselves and to Others," with Walter W. May, editor and publisher of the Oregon Voter, Portland, as panel moderator.

The first panel member, Edward Wellin, Ph.D., director of APHA's behavioral science project, spoke on the specific communications problems health officers, public health nurses, and sanitarians face as they deal with the community. Russell Pierce, president of the company bearing his name in San Francisco represented the businessman's viewpoint on the panel. He urged public health workers to let the public know more of what they are doing through all modern channels of communication. John H. Waterman, M.D., director of the Mental Health Section, Oregon State Board of Health, illustrated how successful communicators on a person-to-person basis are sensitive to the needs of the total individual and his personality.

Robert E. Mytinger, director of the Western Regional Office of APHA, the final speaker on the panel, presented the "why" of communication. Public health problems keep changing. As new knowledge unfolds, public health workers must be prepared not only to meet and accept

changes themselves but also to help others understand and adapt to them as well. Good communications are thus needed, for example, in the shifting emphasis from disease centered to positive health programs, first in worker understanding and then in interpretation to the public.

On the second day of the meeting, four separate work groups devoted the morning to: aging and the public health; conservation of Oregon water supplies; zoonoses; and achieving effective coordination of health, education and welfare services. All four topics were handled as familiar problems requiring new communications approaches in their solution.

In the afternoon the sections held separate luncheon and business meetings preceding the general business meeting. Members adopted the Board of Directors recommendations to increase the annual membership dues to $2 with the stipulation that 50 cents of the dues of each member be given to the section to which he belongs to help defray its operating costs. The board also recommended that each section elect a representative to the board, increasing the board to 14 members. A questionnaire is to be sent to members asking them to indicate their preference as to dates for the annual meeting.

The annual banquet was held that evening. Entertainment was provided by a group of students from South Eugene High School. Following the installation of new officers the OPHA Annual Award for outstanding work in the field of public health was presented to Adolph Weinzirl, M.D., professor and chairman of the Department of Public Health and Preventive Medicine, University of Oregon Medical School, Portland.

The final morning session led off with Barkev Sanders, Ph.D., Bureau of State Services, PHS, reporting on the situation in local health services, both nationally and in Oregon. Summary reports from the four Wednesday morning work groups were presented. Robert Mytinger gave the conference summary.

OPHA officers for 1960 are:

President—Gatlin R. Brandon, director, Public Health Laboratory, Oregon State Board of Health

Vice-President—William B. Culham

President-Elect—Claire V. Langton, Dr.P.H., director, Division of Health and Physical Education, Oregon State College, Corvallis

Secretary—Muriel S. David, City of Portland Bureau of Health

Treasurer—John H. Graham.

American Public Health Association membership application blank on page XLIII

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Director of Public Health—Salary range $899-$1,100 per month. Appointment may be made above minimum rate. Responsible for planning and directing the work of a health department with 31 employees. Enforces state health laws and county ordinances and does such other work as may be required by the board of supervisors. Butte County, located in the upper Sacramento Valley, extends from the heavy forest lands of the Sierra Nevadas to the rich rice and fruit areas along the Sacramento and Feather Rivers. It is the home of northern California's State College at Chico. M.D. degree plus public health training and experience required. Person appointed must have valid license to practice medicine in California prior to date of employment. Contact Administrative Officer, Butte County, Courthouse, Oroville, Calif.

Public Health Officer—wanted for well established local health department. M.P.H. and M.D. required. Salary $12,000, plus travel, retirement, vacation, and sick leave. Lee County Health Department, Dixon, Ill.

Associate Public Health Physician (Medical Rehabilitation)—for New York State Department of Health, Albany, N. Y., to assist in the development and administration of state-wide program of medical rehabilitation. Salary $11,152-$13,162 in five annual increments. Two years of satisfactory public health experience in the specialty and either an M.P.H. degree or an additional two years of appropriate public health or clinical experience. Position under civil service, liberal vacation and sick leave allowances, Social Security, retirement and insurance benefits. Write Director of Personnel, New York State Department of Health, 84 Holland Ave., Albany, N. Y.

Pediatrician—for State Health Department. To act as pediatric consultant within agency and work with professional and lay groups in the field. Included in work: hospital standards; school health problems; statistical studies; future program planning. Starting salary $10,320. Ohio medical license, one-year internship, at least two years' graduate training required; preferably Board of Pediatrics or eligible. Civil service position; vacation and sick leave, annual salary increments, retirement plan. Staff appointment to state university if eligible. Address inquiries to Division of Child Hygiene, Ohio Department of Health, Columbus 15, Ohio.

Public Health Physician—Chief, Personal Health Services (programs in communicable disease control, maternal and child health, medical care). Interesting and challenging opportunity. Urban health department, to occupy new quarters in near future. Good, balanced staff; full program activity; medical center city; excellent retirement and personnel policies. M.P.H. required, experience desired. Salary to $11,960. Possibility of teaching appointments. Write to Director, City Health Department, Richmond, Va.

Director, Bureau of Maternal and Child Health—Plans and directs a state-wide program for the conservation and improvement of maternal and child health; coordinates and supervises the activities of the bureau. Major activities include the child guidance, school health, and nutrition programs. Desirable qualifications and experience: M.P.H., one year's experience in private practice, five years' experience in public health work, three years of which shall have been in an administrative capacity. Pediatric training desirable. Eligibility for license to practice medicine in Wisconsin required. Salary starts at $1,123 per month, with annual merit increases of $40 to $1,298. Civil service, vacation, sick leave, Social Security, retirement benefits. Group life, hospital, and sickness insurance costs shared by the state. Write E. H. Jorris, M.D., Assistant State Health Officer, 1 West Wilson St., Madison 2, Wis.

Director, Local Health Services—Wisconsin. Work with the state health officer and professional staff in improvement of local health services. M.P.H. degree and eligibility for license to practice medicine in Wisconsin required. Salary $1,013-$1,248, commensurate with experience. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Public Health Physician (District Health Officer)—Various locations available in Wisconsin. Act as medical public health administrator of district area; district epidemiologist; plan, organize, supervise work of professional staff consisting of engineers, nurses, sanitarians, nutritionist, dental hygienist, health educators, and social workers. M.P.H. degree, public health experience, and eligibility for license to practice medicine in Wisconsin required. Salary $12,168-$14,988, plus travel allowance. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Public Health Nurse—Generalized. Salary $384-$466; mileage. Retirement plan, other benefits. High, dry climate, four seasons; center of northern Arizona recreation area. Merit system. Write Merle E. Smith, M.D., M.P.H., Director, Coconino County Health Department, Flagstaff, Ariz.

Staff Nurse—Well organized, long established school health department in lovely Santa Barbara. Beginning salary $4,900 to $5,200; annual increment to $7,485 or $8,200. Tenure, 35-hour week, work nine calendar months, usual school vacation. B.A. or B.S. and P.H.N. required; own car, $150 allowance. Apply: L. C. N. Wayland, M.D., Santa Barbara City Schools, 115 West Victoria St., Santa Barbara, Calif.

Executive Director — Combined public health nursing agency. Education and experience in public health nursing, including supervisory experience. Have well qualified health officer. Salary open. Five-day, 40-hour week, month's vacation, and liberal personnel policies. Capital city, population 216,000. Public Health Nursing Association, Des Moines, Iowa. Write Mrs. J. R. McNerney, Personnel Committee, 521 16th St., West Des Moines, Iowa.

Public Health Nurse I — $5,057-$5,537. Challenging position in generalized public health nursing with progressive suburban department 17 miles west of downtown Detroit. Many liberal fringe benefits. Apply, Amalia Krause, Nursing Director, Wayne County Health Department, Eloise, Mich.

Junior Public Health Nurse — Salary range $4,160-$4,979. Liberal retirement and sick leave benefits. New modern building. Promotional opportunities. Apply Flint Civil Service Commission, City Hall, Flint 2, Mich.

Public Health Nurses—Salaries $335-$455. For generalized public health nursing in New Mexico Department of Public Health. Opportunities for advancement, retirement plan, and other fringe benefits. Write Merit System Supervisor, 122 Capitol Pl., Santa Fe, N. M.

Public Health Nurse—Generalized public health nursing program in county health department. Salary range $350-$450, dependent on education and experience; liberal benefits. Write to Dr. Dorothy M. Van Ausdal, 416 N. Erie St., Toledo, Ohio.

Public Health Nursing Consultant (Assistant to Director of Public Health Nursing in State Health Department)—Give consultation to public health personnel in all phases of public health nursing, including in-service education; prepare manuals, guides, etc., for public health nurses; assist in administration of program. Bachelor's degree in public health nursing minimum preparation: master's degree desirable; four years' experience in public health nursing, including two in administration or supervision. Salary: start at $6,768, maximum $8,088. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write Miss Ione M. Rowley, R.N., Director, Public Health Nursing, 119 Monona Ave., Madison 3, Wis.

Public Health Nurse III (District Advisory Nurse)—Give guidance and counseling to all public health nurses in a multiple-county area regarding community organization and relationships, program planning, public health nursing technics, records, and reporting. Responsible for inservice education program for local public health nurses and evaluation of nursing services. Salary range $5,688-$6,768, plus travel allowance. B.S. degree with major in public health nursing and three years' generalized experience as a public health nurse. Special requirement: registration or eligibility therefor as a registered nurse in Wisconsin; certification or eligibilty for certification as a public health nurse in Wisconsin. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Nonmedical Director of Public Health—Lay administrator in city of 45,000 population. Staff of 14 carries out programs including public health nursing, environmental sanitation, meat, milk, and restaurant inspections, etc. Salary open. Apply in writing, stating qualifications and present salary to City Manager, City Hall, Oshkosh, Wis.

WANTED

Public Health Engineer II—Qualifications: Master's degree with at least two years of experience in a state or local health department. Duties: Direction of activities of the Sanitation Division, one of three major divisions of the Bureau of Environmental Sanitation, supervision of 36 employees. Salary range $7,819-$8,473. Additional $25 monthly for engineer registered in Wisconsin.

Nutritionist—to organize and execute nutrition program for Milwaukee City Health Department. Qualifications: Master's degree in nutrition and three years' experience in a public or voluntary health agency. Salary range $6,121-$6,396.

Civil Service Position — Vacation, sick leave, medical and hospital insurance, and liberal pension plan. Write to E. R. Krumbiegel, M.D., Commissioner of Health, 841 N. Broadway, Milwaukee 2, Wis.

Senior Public Health Educator — New York State Department of Health, Albany, N. Y. Salary $6,614-$7,388 in three annual increments. Nation-wide written examination June 11, 1960. Filing closes May 9, 1960. Candidates must have an M.P.H. in public health education and two years of approved agency public health experience, including one year of closely supervised field experience. In addition, one more year of such experience or two years of related professional experience in one or more of the following fields: group or organizational work for community or voluntary agencies; public health nursing; social case work; medical and psychiatric social work; teaching in the fields of education, health education, psychology, social sciences, home economics, agricultural extension or adult education. Equivalents of the additional requirements also considered. For detailed announcements and applications, write to Recruitment Unit, Box 23, New York State Department of Civil Service, State Campus, Albany 1, N. Y.

Health Education Director — Develop school-community health education program; advise and assist local tuberculosis associations. Qualifications: M.P.H. degree plus two years' experience in health education. Salary $6,200 to $8,000 in five years. Social Seecurity; retirement plan. Write Kenneth C. Ross, Executive Secretary, Oregon Tuberculosis and Health Association, 605 Woodlark Bldg., Portland 5, Ore.

Public Health Educator III—Initiate and develop school-community health education programs in a multicounty district. Desirable qualifications: M.P.H. degree, plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary starts at $6,048, maximum $7,188. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write Dr. Amy L. Hunter, Director, Bureau of Maternal and Child Health, Wisconsin State Board of Health, Madison 2, Wis.

Public Health Educator III (Dental Hygienist) — Assist in developing dental health programs for preschool and adult groups in a several county area. Coordinate dental health education activities with over-all health education program. College graduation, a year of graduate training in an accredited school of public health, and two years' experience. Licensure or eligibility for licensure to practice dental hygiene in Wisconsin essential. Salary starts at $6,048, maximum $7,188. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write R. J. Siesen, Personnel Officer, State Board of Health, 400 State Office Bldg., Madison 2, Wis.

Public Health Laboratory Workers—The Wisconsin State Laboratory of Hygiene, which is affiliated with the University of Wisconsin, announces the following openings with the starting salary indicated in parentheses: Three bacteriologists ($449, $504, and $564), two virologists ($389 and $504), all of which require a degree in bacteriology, some a master's or doctorate degree; also, a medical technologist (serologist) ($389). Civil service, vacation, sick leave, Social Security, health and life insurance, and retirement benefits. Write A. S. Evans, M.D., Director, 437 Henry Mall, Madison 6, Wis.

Public Health Sanitarian — Minimum of two years' college training plus experience, or four years' training without experience. Generalized sanitation program, with emphasis on housing, in forward-looking suburb located on Long Island Sound near New York. Apply Director of Health, Town Hall, Fairfield, Conn.

Nonmedical Health Officer — for established city health department serving a population of 18,500. Public health sanitarian with graduate degree or equivalent experience desired. Good personnel policies with paid vacation, retirement, sick leave, and car allowance. Starting salary $6,500 and up depending on qualifications. Contact Robert McGregor, City Manager, Painesville, Ohio.

Public Health Sanitarian — wanted for generalized program of environmental health in a City Health Department in Wisconsin. Starting salary $5,196 annually, increasing over a two-year period to $5,736. Liberal hospital, medical care, and retirement benefits. Pre-

vious courses in sanitary science required. Health department is well organized and long established. City is industrial community of 85,000 population on Lake Michigan between Chicago and Milwaukee. Write Albert C. Edwards, M.D., Racine Health Department, 730 Washington Ave., Racine, Wis.

Medical Social Work Consultant III—for programs in tuberculosis and chronic disease. Salary range $6,389.28-$8,164.08. Minimum requirements: Full graduate training with emphasis on medical or psychiatric social work and two years' experience in the social work program of a hospital or other health facility. All Michigan Civil Service benefits. Apply Frank B. Krupiarz, Personnel Officer, Michigan Department of Health, Lansing 4, Mich.

Social Worker—New job in a special research project related to the new Birth Defects Study Center at Children's Hospital in Columbus needs a social worker with research orientation and a master's degree. Apply Personnel Department, Children's Hospital, 17th at Livingston Park, Columbus 5, Ohio.

Medical Social Worker — Tuberculosis hospital, Ohio. Salary open. Contact E. F. Conlogue, M.D., Medical Superintendent, Stillwater Sanatorium, 8100 North Main St., Dayton 5, Ohio.

Social Work Administrator—State Board of Health, Child Guidance Division, Madison 2, Wis., Amy L. Hunter, M.D. Creative pioneering opportunity for mature, experienced social worker. Plan and integrate social work facets of public health program for prevention of emotional health problems; team approach in organization and coordination of various state-wide educational and consultation projects, including inservice training of state and local public health personnel and other professionals; education of lay groups; emphasis on discussion process to increase understanding and enhance constructive attitudes supportive of primary prevention; supervise several social workers serving on a district level in the above program. Headquarters: Madison. Requirements: M.S.W.; minimum of five years' relevant experience, mainly in community child guidance clinic team, including two years as a social work supervisor. Salary $7,368-$8,748.

Director, Vital Statistics—for the Colorado State Department of Public Health. Offices in Denver, Colo. Salary $570-$727 per month. Depending on qualifications, may start at $628 per month. Qualifications: master's degree in statistics or related field and five years' experience, two of which must have been in a supervisory capacity in a vital statistics unit or related program. Address inquiries to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Public Health Statistician—Opening for chief statistician to direct statistical work in Health Division of the city of St. Louis. Master's degree in biostatistics or equivalent required. Sick leave, 11 paid holidays, three weeks' vacation. Write for further details. Department of Personnel, 235 Municipal Courts Bldg., St. Louis 3, Mo.

Dental Hygienists—Must have M.P.H. degree and preferably some public health work experience. Salary $460-$575. Civil service; Social Security and state retirement coverage. Write Mr. Alfred T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

Public Health Epidemiologist VI — $13,885-$16,390. This position is with the Michigan Department of Health in the control of tuberculosis and adult health and chronic diseases such as cancer, heart disease, and diabetes. You must have a master's degree in public health, one year of professional medical experience in public health, and a license to practice medicine in Michigan. All Michigan civil service benefits. For further information write Michigan Department of Health, Mr. Frank Krupiarz, Personnel Officer, Lansing 4, Mich.

Director of Health—Heads city of Saginaw, Michigan Health Department; 100,000 population. Council-Manager city. Progressive jurisdiction. Salary range $12,000-$15,000. Entrance rate depends upon qualifications. M.D. with some public health experience; M.P.H. degree desirable. Please apply Room 201, City Hall, Saginaw, Mich.

Mental Health Consultant Nurse — for state-wide position in Division of Mental Health, Santa Fe. Salary range $425-$575. Graduate training or experience in mental health nursing required. Fringe benefits, excellent climate, recreation, cultural events. Write Merit System Supervisor, 122 Capitol Pl., Santa Fe, N. M.

Sanitary Engineer or Sanitarian — to work alone in county with population of 36,000. Salary range $5,000-$5,500. Vacation and sick leave benefits. Write to Milton Conine, Chairman, Health Committee, Livingston County Health Department, Howell, Mich.

Assistant Director of Public Health Nursing — Small local health department. Minimum of two years' experience as staff nurse. California registration and public health nursing certificate required; some field work. Salary $4,980-$6,060. Write to A. Frank Brewer, M.D., Merced County Health Department, P. O. Box 1350, Merced, Calif.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Geneticist—Ph.D. (also biomedical and nutrition training). Professional experience includes public health and nutrition surveys; development of research technics; animal tests, laboratory tests, and population studies; biometrics; design of experiments; IBM data and information analysis; administration. Publications. Desire position with active, progressive health program. **Box L-73,** Employment Service, APHA.

Assistant Hospital Administrator—Age 25, married. B.S., business administration; M.S., hospital administration, June, 1960. Desire administrative position in hospital or related service agency. **Box C-51,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Medical health officer, city department of public health near Chicago, start $16,000. (b) M.D. public health administrator, newly created position as assistant director in state program: $14,000-$16,000; Midwest. (c) Public health physician, begin trainee status or serve as assistant until qualified assume position tricity health commissioner; wealthy agricultural area; Midwest. (d) District M.D. health officer, four counties, South West ranch country; $10,000 up. (e) Medical director, research center of leading eastern industry; organize, develop, administer preventive medical program; prefer certified internist. (f) Outpatient nurse supervisor; busy department greater Manhattan, N. Y.; $5,000 up. (g) P.H. nurse supervisor, interpret program to community; assist planning for area; progressive department southern California; to $7,000. (h) Director of nurses, wealthy southern ocean city health department; $7,200 start; RN-4—6.

SITUATIONS WANTED

(a) M.D. health commissioner, F.A.C.P.; diplomate, preventive medicine; 15 years' experience aviation, research medicine. (b) Industrial nurse administrator, M.P.H. Yale; ten years' experience industrial occupational health, research.

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

THE VIRUSES—VOLUME 2, PLANT AND BACTERIAL VIRUSES, VOLUME 3, ANIMAL VIRUSES (1st Ed.)—Edited by F. M. Burnet and W. M. Stanley. New York, N. Y.: Academic Press (111 Fifth Ave.), 1959. Volume 2, 408 pp. Price, $13.00. Volume 3, 428 pp. Price, $12.00.

These two volumes of "The Viruses" very accurately and completely reflect modern trends of virology and discuss viruses, not particularly as agents of disease but rather as biological entities, that can be studied by means of biochemical, biological, and biophysical approaches. Volume 2 deals specifically with plant and bacterial viruses, while Volume 3 concerns the animal viruses. Individual chapters in these two books are written by workers who are authorities in their particular fields, and the list of contributors is indeed a very distinguished one. The marked impact of recent work, in bacteriophagy as well as in nucleoprotein chemistry, in directing the trends of current virology is outstandingly evident in many chapters, even those not dealing specifically with phage or viral chemistry. By and large this emphasis is good because it may tend to guide and inspire nonchemical and nonphage-slanted virologists into channels of thinking that will prove profitable in new ideas and new experimental approaches.

Most of the chapters are very well written and exhaustively cover the subject under discussion. A few are somewhat narrow in that they neglect early background observations and tend to overemphasize the contributor's own particular field of interest.

These two volumes should be of great value and interest even to the established working virologist because they supply, within their covers, practically all of the current knowledge concerning the biochemical, biological, and biophysical properties of viruses—knowledge that he could not ferret out from the original publications in years of his own search and reading. For the student in virology or the youngster aspiring to a career in virology, it seems to this reviewer these books are "musts." They should also constitute essential additions to the libraries of medical schools or laboratories in which any interest in virology exists. They are not recommended for casual light reading by those with only a remote interest in virology.

RICHARD E. SHOPE

NURSING HOME MANAGEMENT—By Ralph C. Williams, et al. New York, N. Y.: F. W. Dodge (119 West 40th St.), 1959. 230 pp. Price, $8.50.

This is a timely, informative publication with broad coverage of various phases of nursing home management. The book is directed toward nursing home administrators.

Some chapters are more informative and easily understood than others. For example, the chapters "Recreational Facilities and Group Programs" and "Safety Program" are particularly good in that the authors give methods for developing programs; make recommendations concerning consultation with specialists in the areas concerned; and point up the need for nursing home personnel education and training. The chapter "Medical and Nursing Care" covers some of the medical aspects and gives limited attention to nursing services—the principal services offered in nursing homes. Some of the sample procedure technics are incomplete and written in language that many nonprofessional nurse personnel would not un-

derstand: for example, "General Health Examination" includes this statement: "anatomical structure and chemical and emotional action and reactions." The section on "Incontinent Patients" would be strengthened considerably by suggesting ways of retraining for bowel and bladder control. The "Food Service Department" chapter discusses the fundamentals of good nutrition for the aged and how it should be applied in the planning of menus. Some of the material on special diets is quite complex for a nursing home administrator and staff untrained in the field of nutrition. In general, the authors have alerted the administrator to various facets of food service that need to be considered in a well organized nursing home. In an early chapter the term "skilled nursing care" is used as one criterion for classification of establishments for the aged. This term is confusing and misleading because it means different things to different people. The authors refer to it as the provision of nursing care by either professional or practical nursing personnel. The term itself implies nursing practice and has not been defined by the nursing profession. FRANCES S. WOLFORD

GROUND WATER HYDROLOGY—By David K. Todd. New York, N. Y.: Wiley (440 Fourth Ave.), 1959. 336 pp. Price, $10.75.

In this book the author presents in a clear and well organized manner the fundamental concepts of occurrence and behavior of ground water, together with the principles of ground water development. Of particular importance is the compilation for the first time in a single treatise of our recently acquired knowledge of surface and subsurface investigations, artificial recharge, sea water intrusion, model studies, and numerical analysis of ground water. Previously, this information was scattered through issues of recent technical journals, research reports, and files of administrative agencies. The author's familiarity with much of this material stems from his own participation in ground water research. He presents this material with a good balance between mathematical and narrative treatment.

Effective use is made of tables, graphs, and diagrams which illustrate the principles presented or assist in the solution of equations. An unusually extensive list of references appears at the end of each of the 14 chapters. By confining the scope of the book to ground water hydrology the author has avoided repetition of the general material found in other current treatises on hydrology, yet developing an important area not adequately treated in any of them. The result is a work valuable both as a textbook for college students and as a reference for engineers, geologists, and researchers concerned with water resource development.

P. H. MCGAUHEY

CASES IN HOSPITAL ADMINISTRATION—By George F. Billington. New York, N. Y.: School of Public Health and Administrative Medicine, Columbia University (600 West 168th St.), 1959. 178 pp. Limited distribution free.

This publication is an outgrowth of a special project conducted by the author under the direction of Dr. E. Dwight Barnett in the Program in Hospital Administration at Columbia University with support from the W. K. Kellogg Foundation. The purpose of this project was to study the possible use of the case method in the hospital administration curriculum.

This volume contains a brief review of the theory underlying the use of the case method and a concise outline of the manner in which the project was conducted, the procedures followed in developing the cases, and the principles which were set forth to govern their use as a teaching tool. This is

followed by the presentation of a selection of 23 cases. Each of these is a written record of an actual problem, an incident, or related group of incidents which constituted an issue faced by a person or organization in the administration of a hospital.

The case method as a teaching tool has been used in law and medicine for many decades. It was introduced in the study of administration by the Harvard Business School in the 1920's, and is now also widely used in other fields of administration such as educational administration, public administration, and public health administration. The case material collected in this book should provide very useful material to the faculties of hospital administration in helping to give their students a reasonable verisimilitude of experience within which, under guidance, these students may be stimulated to improve their understanding and their skill. The incidents used in this selection provide opportunities for discussing a wide variety of generally basic and vital aspects of hospital administration, albeit the amount of detail and background information provided varies a good deal from case to case.

The use of this book is further facilitated by the fact that ". . . any university is granted the privilege of reproducing, for teaching purposes only and not for sale, any of the cases contained in this volume."

CECIL G. SHEPS

PRINCIPLES OF ADMINISTRATION APPLIED TO NURSING SERVICE—By H. A. Goddard. World Health Organization Monograph Series No. 41. New York, N. Y.: Columbia University Press (2960 Broadway), 1958. 108 pp. Price, $4.00.

This compact little volume, while dealing with nursing service administration in a broad sense, includes sufficient application to public health nursing to be practical for a public health nursing administrator or those who teach in this area to use. The author consulted first with a representative group of British nurse administrators and later with an advisory nursing group convened by the World Health Organization. His discussion of principles draws upon sources such as Fayol, Urwick, and Follett, which are also widely utilized by American writers concerned with administration.

The care of patients in hospital or public health nursing settings is the main focus. Various principles and technics of administration reviewed in relation to this provide the reader with brief but pertinent examples of the hows and whys of administrative process. A final brief chapter entitled "A Philosophy of Administration" presents six key points which summarize the previous presentations.

An appendix contains sample forms such as job description or evaluation of nursing performance. An annotated bibliography of up-to-date references adds to the value of the work; twenty-one of the thirty-one items are United States publications.

MARION MURPHY

THE TRUTH ABOUT YOUR EYES (2nd ed.)—By Derrick Vail, M.D., New York, N. Y.: Farrar, Straus, and Cudahy (101 Fifth Ave.), 1959. 180 pp. Price, $3.50.

Dr. Vail succeeds admirably in putting into layman's language information about the eye that, if acted upon, will do much to conserve his sight and prevent blindness. Furthermore, this volume explains how one should behave to obtain the greatest usefulness from the visual equipment he has. By dispelling misconceptions and stating candidly what we do and do not know, the author puts visual problems in a perspective that precludes false hopes and yet avoids a "do nothing" pessimism.

While this book has been written

essentially for laymen, its complete coverage will serve well to answer many questions asked by professional persons in the health field. Will a child outgrow a squint? What, really, is eyestrain? How important are eye troubles in explaining reading difficulties? What are the relative competences of the ophthalmologist (oculist), optician, and optometrist?

One could wish for more and better illustrations to support the text on the anatomy of the eye and the physiology and physics of vision. We are dealing with a very complex organ and sense. Many will have difficulty in understanding either at best. Fortunately, this is not required for persons to act intelligently to conserve this most important of our special senses. Dr. Vail quite clearly sets out the guide lines for enlightened behavior with respect to a person's eyesight. JOHN W. FERREE

PSYCHOSOCIAL PROBLEMS OF COLLEGE MEN—Edited by Bryant M. Wedge. New Haven, Conn.: Yale University Press, 1958. 291 pp. Price, $6.50.

This book is important to higher education in its leadership of human behavior. It deals with selection and environmental conditions of students at Yale. Among questions raised is the idea of fixed personality before college age and differences in age groups. Group studies by questionnaires indicate for students, favorable satisfactions, personality and scholastic achievements based upon study habits in college, and social behavior based upon moral values, etc.; value systems and the like need further study.

Of underachievers, adjustment reactors of adolescence usually graduate with treatment or change of majors. In order of more difficulty come neurotics, character disorders, and psychotics. Interpersonal family relations seem prominent in all of these. Leaving college is often constructive and when based upon psychosis is not as serious as supposed. Academic standing before leaving was best index of returning for those who left due to emotional reasons.

Many valid items of personality and athletic competition are related, without summary, by an author who is both psychologist and coach. Clinical problems are mainly maladjustment, dissatisfaction, and self-depreciation. Group therapy gave some symptomatic improvement and no adverse results. The fewer borderline cases seem to justify available therapy. More analytic studies are reported for selected cases of homosexuality, identity function, intellectual achievement and identification, and adaptation to early family influence.

WARREN FORSYTHE

ELEMENTARY STATISTICS WITH APPLICATIONS IN MEDICINE AND THE BIOLOGICAL SCIENCES—By Frederick E. Croxton. New York, N. Y.: Dover Publications (180 Varick St.), 1959. 376 pp. Price, $1.95.

The topics covered in this text consist, with the exception of the material on time series and index numbers, of those contained in Croxton and Cowden's "Applied General Statistics." The over-all treatment is the same, except for the omission of the more sophisticated algebraic arguments, and the use of examples from medicine and biology.

The assortment of topics is not ideally suited to the biological sciences. Skewness and kurtosis are treated at some length, and relatively advanced technics such as multiple correlation are introduced, while such useful elementary topics as normalizing transformations and nonparametric tests are omitted.

From the standpoint of a survey course in public health statistics, the text overemphasizes computational technics at the expense of general concepts and has very little on vital statistics, and other topics in the field of biostatistics.

JACOB YERUSHALMY

RADIATION PRESERVATION OF FOOD—U. S. Army Quartermaster Corps PB 151493. Washington, D. C.: Government Printing Office, 1957. 475 pp. Price, $5.00.

This monograph initiates the United States Army Research and Development Series. The purpose of this series is to provide for the publication, in permanent book form, of significant research results of current interest, to which the laboratories of the U. S. Army have contributed.

This monograph contains data which has been published in the journals, as well as important findings contained in government reports and unpublished files. It reviews the integrated program to develop the preservation of food by ionizing radiations.

Prepared by a board of six editors and based on the contributions of 36 authors, it treats the subject completely from the social implications and historical aspects to an estimate of future progress. The military interest in logistics led the government to support the work which will, undoubtedly, accrue to the benefit of the consuming public.

The 21 chapters dealing with physical, chemical, and biological aspects make up the largest part of the work and reveal the immense complexity of the irradiation processes. The section on technological aspects deals with the wholesomeness of irradiated foods, processing, and packaging as well as a study of the sources of radiation.

While it is assuring to learn, "It appears from the experimental work cited above that this new method of food preservation does not significantly alter the wholesomeness of the food"—a warning note continues—"Nevertheless, as Lehman and Laug have emphasized, it will be necessary to utilize all techniques at our disposal to insure the subtle changes produced by the irradiation of food do not have a deleterious effect when widely used."

The future predictions are optimistic, but recent Army action in stopping the work on the construction of the pilot plant indicates the magnitude of additional research required before such a step is warranted.

It is a valuable assistance for the food researcher entering this field. The average public health worker will find the work interesting, but highly technical reading. Since the actuality of irradiated foods and the problems of industrial safety in irradiation plants are still remote, it entails no immediate public health problem. The use of radiation at low dosage rates to control insect infestation, inhibition of sprouting, and parasite inactivation will probably be the first practical uses. Those with special interest in this field will find the work of great value. F. C. BASELT

PROCEEDINGS—NATIONAL CONFERENCE ON AIR POLLUTION—WASHINGTON, D. C. NOVEMBER 18-20, 1958—U. S. Department of Health, Education, and Welfare, Public Health Service. Washington, D. C.: U. S. Government Printing Office, 1959. 526 pp. Price, $1.75.

Speculation nearly always vies with fact for the public ear. So it is with air pollution, a problem which has grown in proportion to our great demand for consumer goods and our booming national economy.

An important recent contribution to the increasing quantity of facts on air pollution was made by the U. S. Department of Health, Education, and Welfare through its Public Health Service. The Surgeon General in November, 1958, organized the National Conference on Air Pollution in Washington and invited many air pollution experts to discuss their fields of specialization.

Out of the three-day conference came this 526-page volume containing transcripts of one or more papers, talks, or lectures given by more than 80 scientists, control officials, administrators, researchers, and other key individuals in this field, which reported results of research

and investigation into many vital aspects of the air pollution field.

The volume contains not only the formal presentations made at plenary and group sessions but also stenographic transcripts of discussion group meetings. Editing has been confined to elimination of repetitions and unnecessary formalities.

Many specific phases of the entire subject of air pollution are contained in the volume under such general headings as extent, sources, effects on health, economic and social effects, control methods and procedures, and the administrative aspects of air pollution. It reports one symposium on the status of knowledge of air pollution and another on accomplishments by control agencies and big industry in their efforts to clean up the air.

Also contained in the "Proceedings" are some 20 pages of reports and recommendations of discussion groups as well as consideration by Health, Education, and Welfare Secretary Arthur S. Flemming of what lies ahead in air pollution, comments by Surgeon General Leroy E. Burney and a general conference summary by Commentator Martin Agronsky. A transcript of proceedings of a pertinent, final day open forum discussion also is reported.

The "Proceedings" is crammed with information and is a valuable reference work for air pollution workers.

ALEXANDER RIHM, JR.

CHILD WELFARE: PRINCIPLES AND METHODS—By Dorothy Zietz. New York, N. Y.: Wiley (440 Fourth Ave.), 1959. 384 pp. Price, $5.50.

The author of this book is a psychiatric social worker on the faculty of Sacramento State College. She teaches child welfare to undergraduate students and this book is an expansion of her lectures. Although the author states that the book is addressed to the college classroom, it serves as an excellent review of the child welfare movement from the early days to the present. The early chapters describe in a colorful way the place of the child in early English heritage and in our colonial days with excellent illustrations from the literature of the day. These two chapters serve to point up the plight of children in a society rapidly becoming industrialized and serve as a basis for later action to protect children against exploitation.

In later chapters, Dr. Zietz describes the three types of child care which prevailed in colonial America—care of the child in his own home supported by outdoor relief, apprenticeship or indenture, or almshouse care. She points out clearly the tragedies of these types of care and the variety of laws and regulations set up by the states to regulate the use of children for hire or self-support. These chapters devoted to the early problems of children in a society which offered them little consideration according to our standards today are replete with good source material and are more adequately handled than the later chapters.

The chapters on the child in the 20th century are again treated historically and refer specifically to the development of services to meet the needs of children under various conditions and in a variety of settings. Public and voluntary efforts are covered equally well, including such programs as the White House Conferences, Children's Bureau, federal legislation for children, the various federal programs providing services to children, and the rapid expansion of voluntary efforts both for service and education. Brief reference is made to the development of social work as a profession and the addition of it to settings such as hospitals, schools, etc.

The last two sections deal with children in need of special protection or with special needs. For the purpose of college students, the content describes very briefly a few of the problems met by children with physical, emotional,

intellectual, or social handicaps, as well as children in need of judicial protection, guidance services, public assistance, and the like.

This book is leveled at the college student and presents for him an interesting, brief overview of the child welfare program. For the experienced reader, it will serve as a good general reference on this subject and as an excellent brief historical presentation of the development of services for children. As such it will be useful to the field of public health. ELIZABETH P. RICE

SCHOOL HEALTH PROGRAM — By Jessie Helen Haag. New York, N. Y.: Henry Holt, College Department (383 Madison Ave.), 1958. 533 pp. Price, $6.50.

Jessie Helen Haag has provided a most comprehensive discussion of the school health program—including services, environment, nutrition, community resources, health of school personnel, relationship of school day to the pupil's total health, health and safety instruction, and organization and administration. Throughout the book she emphasizes the teamwork of various school and community personnel in promoting the health of each individual child. Lay and professional people who are interested in school health programs will find this book helpful reference on many questions, thanks to the author's vast knowledge of research and resources in the field.

Much of this vital information would be more useful to the reader if the author had expressed more concern for child development, parent education, and individual differences in children, parents, school personnel, and communities. Although the roles of some members of the school health team are discussed at length, little recognition is given to the role of parents and of the family physician in helping school personnel to know the child and encourage him to reach his health potentialities. One feels that the program is magnified at the expense of the people, especially the children, for whom the program exists. More attention should also be given to the reasons for adopting recommended procedures and to the underlying philosophy.

It is unfortunate that such a wealth of material does not meet the reader's needs more effectively by better organization and more careful focusing of the important points. Although there are some omissions and some questionable statements of opinion, the main difficulties lie in the overlapping and repetition and in the confusion of the book's organization. In the over 500 pages, few charts or visual aids are included to help interpret the information, and few illustrations are cited of particular children and how their health needs have been met.

OCEANOGRAPHIC SURVEY OF THE CONTINENTAL SHELF AREA OF SOUTHERN CALIFORNIA—State Water Pollution Control Board. Sacramento, Calif.: State Printing Division, 1959. 560 pp. Price, $4.00 plus 16 cents sales tax for purchases from California addresses.

Marine disposal of sewage is practiced in one form or another in almost every coastal city in the United States. Approximately 66 per cent of California's sewage and industrial wastes is discharged to salt waters. A rapidly growing population is also demanding greater recreational use of estuarine and coastal waters.

Recognizing the continuing and probably increasing use of coastal waters for sewage disposal, the State Water Pollution Control Board in 1954 initiated a series of research projects delving into various aspects of the technical and economic phases of marine disposal methods. This report is a preliminary one and records basic data on the characteristics of offshore waters and sediments

of the Southern California shelf. It is a report on the part of the study aimed at: (1) development of quantitative biological, chemical, and physical descriptions of representative marine areas unaffected by waste discharges; (2) determination of quantitative biological, chemical, and physical changes in marine ecology as a result of waste discharges; and (3) development of quantitative evaluation of indexes and parameters for the biological study of effects of waste discharges.

HOUGH, CLEVELAND, OHIO: A STUDY OF SOCIAL LIFE AND CHANGE—By M. B. Sussman and C. White. Cleveland, Ohio: Western Reserve University, 1959. 95 pp. Price, $3.50.

This is the report of a study of a rapidly changing area within urban Cleveland. The study was obviously well designed and the report is well written. While the study is specific to the Hough situation, its approach, methods, and findings each have broader applicability. Material on utilization of, and attitudes toward, health services is rather thin. Despite this minor deficiency, the book and the study it reports are useful models for research workers and community agencies interested in studying and meeting the human needs of our changing urban communities.

HISTORY OF THE AMERICAN DIETETIC ASSOCIATION—Edited by Mary I. Barber. Philadelphia, Pa.: Lippincott (East Washington Square), 1959. 328 pp. Price, $6.00.

This volume begins with "What Is a Dietitian?" and ends with "The ADA in the Space Age." Between, it provides a tidy but nonanalytic history of the dietetic profession and its association.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ANNOTATED BIBLIOGRAPHY—THE OCCURRENCE AND BIOLOGICAL EFFECTS OF FLUORINE COMPOUNDS. VOL. I. THE INORGANIC COMPOUNDS. Books 1 and 2. Irene Campbell and Evelyn M. Widner. Cincinnati, Ohio: Kettering Laboratory, University of Cincinnati, Department of Preventive Medicine and Industrial Health. Price, $25.00.

ANTIBIOTIC SAGE, THE. Henry Welch and Felix Marti-Ibañez. New York, N. Y.: Medical Encyclopedia, 1960. 150 pp. Price, $3.00.

CHARACTER DISORDERS IN PARENTS OF DELINQUENTS. Beatrice S. Reiner and I. Kaufman. New York, N. Y.: Family Service Association of America, 1959. 179 pp. Price, $2.75.

CHEMICAL ANALYSIS OF AIR POLLUTANTS. VOL. 10. Morris B. Jacobs. New York, N. Y.: Interscience Publishers, 1960. 430 pp. Price, $13.50.

CONTROL OF COMMUNICABLE DISEASES IN MAN (9TH ED.). An Official Report of the American Public Health Association. New York, N. Y.: APHA Book Service, 1960. 235 pp. Price, paper edition $1.00; cloth edition, $2.50.

CULTURE OF THE STATE MENTAL HOSPITAL, THE. H. Warren Dunham and S. K. Weinberg. Detroit, Mich.: Wayne State University Press, 1960. 284 pp. Price, $5.00.

ELEMENTS OF VITAL STATISTICS. Bernard Benjamin. Chicago, Ill.: Quadrangle Books, 1960. 352 pp. Price, $10.00.

EPIDEMIOLOGY AND CONTROL OF COMMUNICABLE DISEASES. Fred B. Rogers. Philadelphia, Pa.: Temple University, School of Medicine and Hospital, 1960. 53 pp. Price, $2.50.

ESSENTIALS OF HEALTHIER LIVING. Justus J. Schifferes. New York, N. Y.: Wiley, 1960. 335 pp. Price, $5.50.

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FOODS WITHOUT FADS. E. W. McHenry. Philadelphia, Pa.: Lippincott, 1960. 159 pp. Price, $3.50.

GROWING UP TO LOVE, SEX AND MARRIAGE. Sidney L. Sands. Boston, Mass.: Christopher Publishing House, 1960. 131 pp. Price, $3.00.

HEALTH PHYSICS INSTRUMENTATION. VOL. 1. INTERNATIONAL SERIES OF MONOGRAPHS ON NUCLEAR ENERGY. J. S. Handloser. New York, N. Y.: Pergamon Press, 1959. 182 pp. Price, $6.50.

HUNZA LAND. Allen E. Banik and Renee Taylor. New York, N. Y.: Taplinger, 1960. 239 pp. Price, $4.95.

IN-SERVICE TRAINING AND REDUCED WORKLOADS. Edwin J. Thomas, et al. New York, N. Y.: Russell Sage Foundation, 1960. 130 pp. Price, $2.50.

INTRODUCCION A LA HIGIENE INDUSTRIAL. J. J. Bloomfield. Lima. Peru: International Cooperation Administration. Institute of Inter-American Affairs, Public Health Division, 1959. 318 pp.

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NEW ILLUSTRATED MEDICAL ENCYCLOPEDIA FOR HOME USE. 4 Volumes Boxed. Robert Rothensberg. New York, N. Y.: Harry N. Abrams, 1960. 1454 pp. Price, $50.00 for set.

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SURVEY OF MAJOR PROBLEMS AND SOLUTIONS IN THE FIELD OF THE AGED AND THE AGING. A Compilation of Responses to a Survey by the Subcommittee on Problems of the Aged and Aging of the Committee on Labor and Public Health, U. S. Senate. Washington, D. C.: U. S. Gov. Ptg. Office, 1959. 677 pp.

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

Color Blindness—One man in every ten lacks normal color perception, it is alleged here. Screening in schools for color defective children is recommended. Many men grow up without knowing they are color blind, and since color is used increasingly in industry, transportation, and other aspects of daily life, screening and career guidance might well be a part of the educational process.

ANON. Color Vision. Sight-Saving Rev. 29, 4:197 (Winter), 1959.

Slightly Better—In 1959 the accident death rate decreased fractionally to an all-time low of 52 per 100,000—the fourth year in a row to show a reduction. Two-fifths of the 91,500 lives were taken by the automobile. Accidents arising out of employment killed about 13,000. Civil aviation provided four of the five catastrophes. You will, of course, find many more useful statistics here.

ANON. The Accident Toll in 1959. Statist. Bull. Metrop. Life Insur. Co. 41, 1:7 (Jan.), 1960.

To Teach Is Costly—In this state, the branch of the ARC and the Health Department have collaborated in conducting classes for expectant mothers. Eight years of this experience suggest the need for a hard look at administrative problems. Obviously the program is costly in professional and clerical time. Although the expense is substantial, financing is not the most critical problem.

AKIN, K. Mother and Baby Care. Nursing Outlook 7, 12:706 (Dec.), 1959.

"Major Duty"—"It is abundantly clear," says this Canadian health official, "that an enlightened public is still the missing ingredient to the more general acceptance of fluoridation. There seems little prospect of accelerating the tempo of fluoridation unless we harness public support and translate latent desire into forceful public demand." To which a lot of disillusioned health workers hereabouts will add a fervent amen.

COMPTON, F. H. A Public Health Perspective on Fluoridation. Canad. J. Pub. Health 51, 1:20 (Jan.), 1960.

Leadership Wanted—In England, where the lung cancer rate is higher than ours, the authorities have not only the same hazards to contend with as we—cigarettes, automobile exhausts, and certain chemical manufacturing—but they must also cope with domestic soft-coal smoke. Local authorities should have more (central) government backing to tackle these hazards, insists the writer.

CUTHBERT, J. Cancer of the Lung—A Public Health Problem? Pub. Health 74, 4:123 (Jan.), 1960.

No Assembly-Line Technics—A symposium on Childbirth Progress and Management will be of interest to many more than just the practicing MCH'ers

among us. The last sentence of the last of the seven excellent papers seems to sum up the theme of all: "In fact, it is now sadly apparent that newborn infants, who have never previously been so mass-produced, must now be more than ever individualized."

DAVIS, M. E., et al. Progress in the Management of Labor and Delivery (and six related papers). J.A.M.A. 172, 5:409 (Jan. 30), 1960.

For Philistines Only—The grant eater and the publication mileage he manages to achieve from the single preliminary report of work begun are given an amusing and critical drubbing in this extention of Parkinson's law into the realm of subsidized medical research.

DE TAKATS, G. Parkinson's Law in Medicine. New England J. Med. 262, 3:126 (Jan. 21), 1960.

More BCG—Just for the record these two quotations from a (Br.) review paper on the present status of tuberculosis treatment and control are hereby immortalized in this peculiar compendium of health opinion. "The recent report of the Tuberculosis Vaccine Trials Committee of the Medical Research Council has provided additional evidence of the value of (BCG) vaccination," and "The loss of the tuberculin test in clinical and epidemiologic work is commonly deplored, but where infection rates remain high . . . the loss of the tuberculin test has a very secondary importance."

GEDDES, J. E. Tuberculosis Today. Pub. Health 74, 3:96 (Dec.), 1959.

People Must Know—"We are running out of facilities to take care of our skyrocketing population," warns this lecturer. Not the least among the facilities we are running out of is municipal and industrial water supply. Unless there is public understanding of this growing shortage no comprehensive program will succeed. With such understanding nothing will fail.

GRAYSON, L. W. Water Supply—America's Greatest Challenge. J. Am. Water Works A. 52, 1:1 (Jan.), 1960.

Required Reading — Nineteenth century ethics, which expected one person to bear what he must, whereas another may take what he can get persist as part of our twentieth century medical mores, says the essayist. Group practice on a prepaid basis becomes the new century's response to newer concepts. You have heard all this before, but you may not have heard the thesis so persuasively presented.

HECKSCHER, A. Medicine and Society. New England J. Med. 262, 1:19 (Jan. 7), 1960.

Where Anti's Prevail—It is suggested that topical applications of fluorides to children's teeth be planned and carried out on a community basis (in those areas lacking fluoride in water supplies). Such programs have succeeded in several states, and the Minnesota community experiences are reported upon here.

JORDAN, W. A. Anticaries Technics in Nonfluoride Areas: Topical Fluoride Treatment. J. Am. Dent. A. 60, 2:181 (Feb.), 1960.

Encouraging Statistic — Respiratory tuberculosis among Selective Service registrants (both white and colored) is now somewhat less than one-third of what it was within a comparable range during World War II.

KARPINOS, B. D. Prevalence of Tuberculosis Among Selective Service Registrants Currently Processed for Military Service. Am. Rev. Resp. Dis. 80, 6:795 (Dec.), 1959.

Compacts vs. Longies—From three widely separated places (in Connecticut, Iowa, and Michigan) come three down-to-earth testimonials to the economy and efficiency of the compact car, as the principal means of conveyance for

public health nurses to do their jobs. There is no reason why common sense should be the privilege of nurses solely!

LAFFY, L. M., et al. The Small Car Has Made It. Nursing Outlook 8, 1:30 (Jan.), 1960.

Return to Life—Treatment in a Providence (R. I.) psychiatric hospital includes follow-up through home visits by hospital nurses. This experience suggests an added role for the versatile public health nurse. It is clear that psychiatric nurses will still be needed to support the general public health nurse when family emergencies arise.

LEPAGE, A. M. A New Role for the Psychiatric Nurse. Nursing Outlook 7, 12:709 (Dec.), 1959.

Reaper Gets the Fat Ones—Among persons over 65 and under 95 overweight men decrease proportionately from 30 per cent to only 10 per cent of the population in each age grouping, whereas under-average-weight men increase from 20 per cent to 55 per cent. Their favorable survival rate speaks eloquently for itself.

MASTER, A. M., et al. Tables of Average Weight and Height of Americans Aged 65 to 94 years. J.A.M.A. 172, 7:658 (Feb. 13), 1960.

Crowded Summer Resorts—When the annual swarm of vacationists descend upon Southport (England), a community of hotels, boarding houses, cafes, and miscellaneous food vending establishments, meal preparation and dispensing becomes a sanitary hazard of the first water. Here was a place crying for courses in food handling. The way the courses were organized and how far they have succeeded is the burden of an especially interesting —for us—story. The editor of that still unique Health Education Journal publishes, as the companion piece to this matter-of-fact report of progress, a philosophic discussion of ways to steer community action into productive channels, written and spoken by our own William Griffiths.

ROBERTSHAW, T. W. The Southport Experiment (and) GRIFFITHS, W. The Principle of Participation. Health Ed. J. 17, 4:215 (Nov.), 1959.

Reaching People's Minds—This paper makes the point that the time has come to enlist the social sciences in our health field—especially in matters of health education. Our prime job nowadays is to get people to recognize health problems and to comprehend the need for action, and this is a big job in which we need the help of all who can contribute.

ROSEN, G. Reflections on Education for Prevention. Canad. J. Pub. Health 51, 1:8 (Jan.), 1960.

Hard-and-Fast — Overimpressed with slogans, "milk is the most nearly perfect food," and the like, some compulsive mothers feed their infants and toddlers too much milk. The answer to the question, how much milk? must be based upon the child's total intake of iron-supplying foods. Posters, and other promotional material that tell what children "must have" need careful scrutiny, says the writer. He concludes, "This avoidance of specific regulations is a basic element in all child guidance and habit formation."

SMITH, C. A. Overuse of Milk in the Diets of Infants and Children. J.A.M.A. 172, 6:567 (Feb. 6), 1960.

In England—"Most Old People's Welfare organizations now operate 'meals on wheels' services," so begins this descriptive and illustrated account of vehicles and food containers used to distribute hot meals to pensioners. The program now in operation "has proved most popular with the old people and the staff."

WEIR, H. A New Look at Meals on Wheels. M. Officer 103, 4:46 (Jan. 22), 1960.

Still the Same Story—Cause of overweight is overeating, but what causes overeating? "How well we can answer the question will determine how well we can treat overweight." The final solution, when boiled down, remains about the same as usual—more activity, fewer calories.

YUDKIN, J. The Cause and Cure of Obesity. Lancet 7112:1135 (Dec. 19), 1959.

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Canad. J. Pub. Health (Canadian Journal of Public Health), 150 College St., Toronto 5, Canada.

Health Ed. J. (Health Education Journal), Tavistock House, Tavistock Sq., London W.C.1, England.

J. Am. Dent. A. (Journal of the American Dental Association), 222 N. Superior St., Chicago, Ill.

J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.

J. Am. Water Works A. (Journal of the American Water Works Association), 2 Park Ave., New York 16, N. Y.

Lancet, 7 Adams St., Adelphi, London, W.C.2, England.

M. Officer (Medical Officer), Chronical House, 72-78 Fleet St., London, E.C.4, England.

New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.

Nursing Outlook, American Journal of Nursing Company, 2 Park Ave., New York 16, N. Y.

Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C.1, England.

Sight-Saving Rev. (Sight-Saving Review), National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, N. Y.

Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin of the Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

CREDIT LINES

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to addresses given.

A Forty-Year Report

Maternity Center Association has many "firsts" to its credit in its history. But as its recently published 40th Annual Report (1918-1958) indicates, "the past is prologue" as far as MCA is concerned. In the present, it continues to pioneer in the development of professional nurse-midwife training programs.

MCA began the first school for nurse-midwives in the United States. It now cosponsors nurse-midwifery courses with Yale, Johns Hopkins, and Columbia Universities, and most recently, with the State University of New York's Downstate Medical Center. MCA-certified nurse-midwives are reported to be working in 26 countries. As to the future, among other objectives it will continue to seek "to break the hold of needless routines upon obstetric and hospital practices and to bring some of the emotionally supportive aspects of home care into the hospital." Students of public health history may find the 22-page "Log" of the MCA from 1915-1958 full of valuable reference material. MCA is located at 48 East 92nd Street, New York 28, N. Y. The report is available in limited supply.

Home Safety Through State Health

"Health Departments Participate in Home Accident Prevention," a National Safety Council report, is based on the 1958 Home Safety Inventory. This, a biennial survey conducted by the Home Department of NSC, showed that 40 state health departments are either developing or are active in programs for home safety. The author, Philip Dykstra (senior consultant to NSC's Home Department), describes how these 40 agencies variously organize and program for home accident prevention, what kinds of home-safety public education they engage in, how they are training agency personnel in this field, and what the departments are researching. As to the future: "State health departments appear to feel the age old pinch of 'lack of personnel and adequate budget.'" Mr. Dykstra originally presented the data in this report in an article in the winter, 1959, issue of NSC's "Home Safety Review." In the introduction, the author cites the pioneering studies done by the APHA Subcommittee on Accident Prevention in 1943, 1950, and 1955. Copies of the report are available without charge, requests welcome. National Safety Council, 475 North Michigan Avenue, Chicago 11, Ill.

Long, Useful Lives After Strokes

"Little Strokes—Hope Through Research" appears to be a very helpful pamphlet for educating persons approaching an age in which they could conceivably suffer little strokes. Younger persons, it notes, may have them too, of course. The authors, from the National Institute of Neurological Diseases and Blindness, have also written with the family in mind. Hope does lie in research; on-going and projected studies are described in language suitable for both the layman and the public health worker. PHS Publication No. 689. Single copies free from NIND & B, Bethesda 14, Md. Quantity orders at $7.50/100 from Government Printing Office, Washington 25, D. C.

Therapy in Man's Social Setting

"All group therapies rest on the principle that humans are social creatures who are profoundly influenced by the groups to which they belong . . . . One advantage of group therapy over individual therapy is that the former is conducted in a situation which is closely related to the patient's everyday life." Jerome D. Frank, M.D., associate professor of psychiatry, Johns Hopkins University, writes of this and several other advantages in "Group Methods in Therapy." The pamphlet contains examples of approaches to the different successful group methods, including both the less and the more famous and both the institutional and the "self-help" type. Public Affairs Pamphlet No. 284. The Public Affairs Committee, 22 East 38th Street, New York 16, N. Y.; 25 cents.

Reading for Busy Administrators

Volume 1, No. 1 of "The Hospital Digest" which appeared in December, 1959, states in its "Reason for Being" that it will present "a cross-section of information, ideas, and opinions in the health field." Taking a fresh approach the editors "may also go back through the years to quote from an author whose thinking was far ahead of his time and is pertinent in the present era." They will "condense articles from publications which are not likely to cross the hospital administrator's desk." No. 1 has two articles in it from the American Journal of Public Health: "How to Achieve More Effective Use of Professional Staff Time" by Harvey L. Shapiro, M.P.H. (July, 1959) and "Alcoholism and the Medical Profession" by Marvin A. Bloch, M.D. (August 1959). Subscriptions: The Hospital Digest, Inc., 30 West Washington Street, Chicago 2, Ill. Domestic rate $2.50 a year; $3.50 elsewhere. (John G. Steinle is editorial director with offices at 53 Hilton Ave., Garden City, N. Y.)

Metropolitan Publishes New Booklets

Metropolitan Life's Health and Welfare Division published two booklets in the latter part of 1959, its 50th anniversary year. The "Home Nursing Handbook," a revision, goes into greater detail of the step-by-step technics of home patient-care. The new version also places more emphasis on advice to the family in facing the emotional impact of a serious illness. "Alcoholism: A Guide for the Family," as simply as the subject permits, describes alcoholism, discusses treatments, and lists some of the ways and means for families to help the patient. Available free, single copies or in quantity. The Division is located at 1 Madison Avenue, New York City 10, N. Y.

A New Compendium on Research

Volume I, "Completed Research in Health, Physical Education, and Recreation" begins a series of annuals which index both published and unpublished research in these fields. In 60 pages it describes unpublished graduate research studies done in 1958 in 26 institutions and lists more than 300 studies from 53 national and international periodicals (including the American Journal of Public Health). Compiled by Doctors Alfred W. Hubbard, University of Illinois and Raymond A. Weiss, New York University, for the American Association for Health, Physical Education, and Recreation of the National Education Association. AAHPER, 1201 16th Street, N.W., Washington 6, D. C.; $1.50.

Nutrition, in English and Spanish

The Cook County (Chicago) Department of Welfare has geared "You and Your Family's Food" to the eating pat-

terms of Puerto Rican and Mexican families. The pamphlet gives practical information on nutrition and foods, with menus, recipes, and shopping tips for a family of four, using current public assistance food figures. "Mrs. Estrella Economica" uses a pleasant conversational tone throughout, as she takes her client through the "easy steps to happy meals." Published in both English and Spanish versions in cooperation with the Chicago Heart Association. Home Economics Unit, Cook County Department of Public Aid, 69 West Washington Street, Chicago 2, Ill.

School Health: Policies, Programs

The Committee on School Health, American Academy of Pediatrics, has issued a new report on school health policies. Noting that "many physicians are perplexed by the subject of 'school health,'" the committee suggests that perhaps a better term is "health program for school-age children." By whatever name called, "the major purpose of a school health program is to maintain, improve and promote the health of the school-age child . . . (in the) physical, mental, emotional and social aspects of school life."

The committee recommends and defines three services needed to support these objectives: health appraisal in regular physical examinations; follow-up to insure medical care after findings; and parent education and counseling to aid them in discharging their major responsibilities in child care. In school, health education should be integrated into courses in language, history, science, physical education and social studies. The committee recognizes that the teaching abilities of professional educators can be combined with the knowledge of physicians, and a good program can be conducted by teamwork among school boards, parents, teachers, nurses, and private and school physicians. From "Pediatrics," October, 1959. Reprints available American Academy of Pediatrics, 1801 Hinman Avenue, Evanston, Ill.

As a public service, Pfizer's "Spectrum" for October-November, 1959, departed from its usual format to present a special "School Health" issue, with prefatory messages from M. G. Candau, M.D., director-general for WHO, Secretary Arthur S. Flemming, and Leona Baumgartner, M.D., commissioner of health, New York City. This issue's many distinguished guest authors and consultants branch out from school health programs in general, into discussions of the school physician both in large cities and in small communities, the school health team, and expenditures. In "School Health Perspectives" note is taken that "in the total picture of school health preservation, some authorities feel that care of the body is of somewhat lesser importance than making children conscious of their intellectual and spiritual capacities . . . that the moral strength and mental vitality of school children should be greatly improved by reducing idleness and daydreaming . . . (this) evidence of ferment is healthy—and the outcome of present probing and questioning of the status quo (should) result in more effective school health services." Illustrated, and with special pictorial sections on national and international school health and the handicapped child. Available at no cost. Address Eric W. Martin, Ph.D., executive editor, Spectrum, Chas. Pfizer & Co., Inc., 11 Bartlet St., Brooklyn, N. Y.

Citizen Know-How for Urban Renewal

"Citizens in Urban Renewal" presents "ways to stimulate constructive citizen support for revitalizing neglected neighborhoods through the process known as urban renewal." Its 40 pages deal with how citizens can go about

fact-finding, organizing for operation, picking a pilot project, cultivating civic consciousness, and protecting property improvements. Handsome art work makes readable text even more meaningful. Prepared by G. Yates Cook, urban renewal consultant, Washington, D. C., for the Urban Renewal Division, Sears Roebuck and Company, 925 S. Homan Avenue, Chicago 7, Ill. Single copies free, additional copies 25 cents each.

Sewage and Industrial Wastes Index

Ready reference to the contents of "Sewage and Industrial Wastes" is now available in the "Ten-Year Index" (January, 1949—December, 1958). The new index supplements the original "20-Year Index" which covers material that appeared in the first years of "Sewage Works Journal." The name of the journal was changed to "Sewage and Industrial Wastes" in 1950. Water Pollution Control Federation, 4435 Wisconsin Avenue, Washington 16, D. C.; $4 for a maroon buckram binding or $3 for heavy paper binding. (Editor's note: the federation has recently changed its name from Federation of Sewage and Industrial Wastes Associations.)

Housing According to Needs

Over a five-year study period the Family Housing Commission of the International Union of Family Organizations has held several conferences on family housing needs, starting with the assumption that any family housing must "spatially, functionally and psychologically . . . endeavor to suit the accommodation of the physical, spiritual and affective requirements of the family, bearing in mind its structure and size." The report of the 1957 meeting in Cologne is contained in "Minimum Habitable Surfaces." The report defines the "Capacity Index," and speaks of it as a "label" for classifying dwellings. In the commission's opinion the best means for measuring the capacity of a particular dwelling is to compute the space reserved for its nighttime premises. This is based upon the theory that normal daytime living can be improvised to a great extent, whereas adequate space and privacy suitable for sleeping is a more demanding consideration. General Secretariat IUFO, 28, Place St-Georges, Paris IX, France; 31 pp., 250 fr.fr. or 4 shillings.

Aids for Rehabilitation Workers

A list of films, publications, and exhibits for use in the vocational rehabilitation of handicapped homemakers, is now available from the School of Home Economics of the University of Connecticut at Storrs. Single copies of many of the publications are available to professional persons without cost. The educational materials in this catalog have been developed at the university over a five-year period for a project supported in part by the Office of Vocational Rehabilitation. Elizabeth E. May, dean of the School of Home Economics, is project director.

Additional Hygienic Guides

The four newest hygienic guides of the American Industrial Hygiene Association cover DDT, Thorium and its Compounds, Parathion, and Tfe-Fluorocarbon Resins and their Decomposition Products. Now numbering 84, the Hygienic Guides bring together all pertinent available information on toxicity, evaluation of exposure, control measures, and medical procedures for the treatment of persons suffering from overexposure to the different poisons. AIHA, 14125 Prevost, Detroit 27, Mich. 25 cents each.

NEWS FROM THE FIELD

WHO News

WHO Executive Board Meets

The Executive Board of the World Health Organization ended its 25th session in Geneva on February 1. The board, which met under the chairmanship of Professor E. Aujaleu, director-general of public health, France, made a number of recommendations to the 13th World Health Assembly, which will open in Geneva on May 3.

Among the items on which the board took action:

Program and Budget for 1961—unanimously recommended to the Health Assembly, adoption of Director-General M. G. Candau's proposals for WHO's 1961 program and regular budget of $18,569,620.

Intensification of Medical Research—endorsed a program based on recommendations of the WHO Advisory Committee on Medical Research. Several board members believe that medical research probably will prove to be the most important function of WHO in the future. The research program will concentrate on malaria, tuberculosis, treponematoses (diseases such as yaws), leprosy, parasitic infections, virus diseases, insecticides, veterinary public health, antibiotics, cancer, cardiovascular diseases, radiation and genetics, and biological standardization. Established on an international, official rather than on an individual-scientist basis, such research could help tie nations together. This goal is being sought by bilateral agreements, such as the recent one between the USSR and the United States. Dr. Candau expressed hope that this move would lead to world-wide cooperation, with both governments using WHO to bring other countries into the sphere of their cooperative efforts.

Headquarters Building — approved steps taken in planning for a new WHO headquarters building to be situated near the Palais des Nations, which houses the European office of the United Nations, as well as WHO's present headquarters in Geneva. Plans for the building and the architect are being chosen through an architectural competition that closes on April 14, 1960.

1961 World Health Assembly—recommended that the 14th World Health Assembly be held in New Delhi in 1961. The government of India extended the invitation and has indicated its willingness to meet $250,000 of the extra costs that would be involved in holding the Assembly away from WHO headquarters.

Prevention Against Radiation Hazards—asked the director-general to study the preventive aspects of reducing radiation hazards and limiting their spread before they become a direct danger to man's health, and to report on this study to the next World Health Assembly.

World Health Year—proposed that a study be made of the potentialities of furthering health progress through holding a World Health Year, and that recommendations should be formulated concerning the possible objectives, organization, program, timing and financing of such a Year.

Disarmament—asked the 13th World Health Assembly to appeal to WHO member states to devote part of the funds released by disarmament, as and when they implement the United Nations General Assembly's unanimous resolution on this matter, to increasing their health budgets.

Automation and Mental Health

"Mental Health Problems of Automation" (Report of a WHO Study Group), discusses the "possible dangers of auto-

mation for the psycho-social foundations of human behavior and for the mental health of individuals who are working in more or less automated factories and offices" and "suggests ways of preventing these dangers or at least which points should be further investigated in order to make reasonable planning possible." Generally, one major objective of this study group is to steer as objective a course as possible through the "too many loose statements of an emotionally charged nature" that are expressed by the optimistic apostles of automation and the pessimistic Cassandras on the subject. WHO Technical Report Series No. 183, Columbia University Press, 2960 Broadway, New York City 27; 30 cents.

Classification of Mental Disorders

The existence of different schools of psychiatry make it difficult to arrive at any uniform and widely accepted system of classifying mental disorders. This leads too often to a breakdown in communications. Dr. E. Stengel, professor of psychiatry, University of Sheffield, England, in a paper submitted to the WHO Expert Committee on Mental Health (June, 1959) undertakes a critical survey of existing classifications and outlines the basic principles on which he believes a generally acceptable international classification may be constructed. He shows, for example, how some difficulties may be overcome by the use of "operational definitions." Uniform classification should "facilitate a broad epidemiological approach to psychiatric research" and "lead to a greater measure of agreement regarding the value of specific treatments for mental disorders."

The paper (63 pages) is printed in the Bulletin of the World Health Organization (Vol 21, No. 4-5, 1959); available through Columbia University Press, 2960 Broadway, New York City 27; $4. (Reprints of the article alone are possibly available at less cost through WHO, Sales Section, Palais des Nations, Geneva, Switzerland.)

50th State Health Officer Inducted

At impressive ceremonies at Honolulu in February, Richard K. C. Lee, M.D., Dr.P.H., was sworn in as the first director of health for the new State of Hawaii. Dr. Lee heads a newly reorganized Department of Health and a comprehensive state health program which includes plans for increased departmental activities in the fields of mental health and mental retardation. Dr. Lee joined the territorial Health Department in 1936 as director of its Bureau of Communicable Diseases; in 1953 he became head of the department itself.

Following Dr. Lee's installation, the Kapuaiwa Club (members are on the staff of the Health Department) honored him with a Recognition Dinner attended by 380 friends including the governor, lieutenant governor, and officials from all the islands in the Hawaiian group. New arrivals in Hawaii, Dr. and Mrs. Ira V. Hiscock, were also present and report that Dr. Lee's speech of "response to testimonials was inspiring, statesmanlike, and moving and gave credit to all concerned in a manner that warmed the heart of everyone and made them feel that they all had great opportunities and responsibilities as an intimate part of a great enterprise."

New Medical Sociology Program

Duke University has established a new educational and research program to provide a training ground for collaboration between social scientists and health workers. Joint heads of the program are John C. McKinney, Ph.D., chairman of the Duke Sociology Department, who has received the additional title of professor of medical sociology; and Ewald W. Busse, M.D., chairman of the Duke Medical Center's Psychiatry

Department. To give substance to its recognition of the need for the closer integration of medicine and the social sciences, the university has given each member of the program faculty joint appointments in the Sociology and Psychiatry Departments.

Operation Friendship II

The twelfth observance of Mental Health Week, May 1-7, 1960, will again center around Operation Friendship, the project inaugurated last year to bring hundreds of thousands of visitors to mental hospitals during Mental Health Week.

The National Association for Mental Health and its co-sponsor of the week, the National Institute of Mental Health, report that with the support of many national organizations, Operation Friendship succeeded in its first year beyond all expectations. The turn-out of more than one million visitors showed the hospitalized mentally ill that their friends and neighbors do care. Operation Friendship also gave these visitors a better understanding of the mentally ill and demonstrated, as well, the hopeful outlook for the treatment of mental illness.

A leaflet describing how organizations can help make a success of Operation Friendship and other observances for the week is available from the National Association For Mental Health, 10 Columbus Circle, New York 19, N. Y. This lists the addresses of state mental health associations from which action kits may be obtained directly.

Merging Trend in Michigan

Kalamazoo and Bay City, Mich., and their respective county governments, recently reached agreements to merge their city and county health departments. This brings to 13 the number of full-time state-approved local health departments serving 69 of Michigan's 83 counties and 95 per cent of its population. Michigan's Department of Health reports that each of the 14 counties not now being served has shown interest in establishing departments whose directors, organization, and program are state-approved.

Among major state health department administrative services to local departments in 1959 were consultations with each on program and budget and four regional conferences conducted for clerical employees in the local agencies.

Outservice Education; Hospitals

A unique training program for hospital department heads has been organized by the North Carolina Memorial Hospital of the University of North Carolina and the Republic of Panama.

Panama is now building a 260-bed general hospital in its capital, and had originally planned to send the department heads who will staff it to different institutions in this country for additional training before the opening of the hospital. Instead, following conversations with representatives of the American Hospital Association and the Public Health Service, it was decided that the entire group of department heads will visit one institution, the North Carolina Memorial Hospital in Chapel Hill, which operates in a setting comparable in a number of important respects to that of the Panamanian hospital.

Students will spend from four to six months in on-the-job training in a program that is designed to meet the specific problems of hospital activation. North Carolina Memorial opened in 1952 and most of its present department heads took part in its activation.

This is said to be "the first time the cadre approach has ever been used in the establishment of a new civilian hospital." It is planned that a research component for the project will evaluate its results and report them in the literature.

Robert R. Cadmus, M.D., is director of the North Carolina Memorial Hospital. Alejandro de la Guardia is director general of the Caja De Seguro Social of Panama, the agency administering that country's official hospital system.

JAPCA Six Times a Year

The Journal of the Air Pollution Control Association became a bi-monthly periodical in February, 1960. It started as a quarterly in 1952 under the name "Air Repair." "APCA News" has been discontinued, a news section having been added to the journal's bi-monthly format. Other new features include editorials, letters to the editors, and personal items. JAPCA expects to become a monthly periodical eventually. Subscription $10; 4400 Fifth Avenue, Pittsburgh 13, Pa.

Nursing Home Construction

In August, 1958, De Kalb County (Mo.) residents went to the polls and voted eight to one to tax themselves $187,000 (about $200 per person on the average) to build a new nursing home for the use of their fellow senior citizens. Recent state legislation had provided for counties to build such facilities, but without federal or state funds. The new one-story home, which accommodates 40 persons—and from the description, very comfortably—was dedicated in November. It is the first such built in the state since enabling legislation was passed.

At the national level, the president of the American Hospital Association, Russell A. Nelson, M.D., director of Johns Hopkins Hospital, has called for a strong program of nursing home construction. Writing in "Hospitals," Journal of the AHA, he said, "Nursing home care is central in the problem of care of the aged." The present system is inadequate. Families too often "find it impossible to accept the lack of facilities, the low standard of care and the high cost. . . . It may be that there is need for a strong program of federal financed assistance in the building of superior nonprofit nursing home facilities. . . ." He noted that the AHA and the nation's doctors "could greatly improve the health care of our older people if they would unite in the intelligent development and promotion" of a nursing home construction program.

AWWA Elects Officers

The American Water Works Association announces the election of its new officers for 1960-1961:

President: C. F. Wertz, director, Department of Water and Sewers, Miami, Fla.
Vice President: John W. Cramer, consulting engineer, Lincoln, Neb.
Treasurer: William J. Orchard, director and consultant, Wallace and Tiernan, Inc., Belleville, N. J.

Raymond J. Faust, who continues as secretary, was awarded an honorary membership by the AWWA board at its January meeting. Similar honors went also to Edward R. Stapley, dean emeritus of engineering, Oklahoma A & M College, and to Paul Weir, manager, Atlanta (Ga.) Water Department. The John M. Diven Memorial Medal was given to E. Shaw Cole, president, The Pitometer Associates, New York City, for the "most outstanding service to the association during the year."

Accidental Death Rates: 1959

Although accidents accounted for some 91,500 deaths across the nation in 1959, slightly more than in 1958, the accident death rate decreased to the record low of 52 per 100,000 population, according to the Statistical Bulletin of the Metropolitan Life Insurance Company (January 1960). Mortality rates from accidents have declined steadily now four years in a row.

Motor vehicles are still the major cause of accidental death. But the death rate per 100 million miles of travel in 1959 was slightly less than the previous record minimum of 5.6 in 1958.

Catastrophes (five or more deaths) accounted for a little more than 1,100 deaths in 1949, 150 fewer than in 1958. Fires and explosions, most of them in the home, caused almost a quarter of the fatalities in catastrophes, and accidents in civil aviation were responsible for somewhat less than one fifth.

Connecticut has publicized its 1959 figures on accidental deaths, claiming just cause for thanksgiving. According to the State Health Department's Weekly Bulletin the accident death rate was the lowest on state record, 32.6 per 100,000 population (19.4 percentage points lower than the national rate). The state's overall accident death rate has also declined steadily for the past four years as it has in the nation.

Project Oral Vaccine: Polio

The first mass trial of oral poliomyelitis vaccine in this country was begun on February 16 in Dade County, Fla., through the joint efforts of the Dade County Medical Association, the University of Miami Medical School, and the Dade County Health Department. This is also described as the largest field trial of any vaccine in the United States.

Goal of the program is complete eradication of the disease among county residents, which include 500,000 persons under 40 years of age. The vaccine (cherry-flavored) being administered was developed by Herald R. Cox, D.Sc., and a research team at Lederle Laboratories. The program conforms with standards formulated by the Public Health Service. Special consultants were Charles Armstrong, M.D., retired medical director of the USPHS Laboratory of Infectious Diseases (now the National Institutes of Health); Henry Bauer, M.D., director, Division of Medical Laboratories, Minnesota Department of Health; Mauricio Martins-da Silva, M.D., poliomyelitis adviser, Communicable Diseases Branch, WHO Pan American Sanitary Bureau; and Leonard M. Schuman, M.D., professor of public health, Schools of Public Health and Medicine, University of Minnesota.

Training Opportunities

The American College of Physicians in cooperation with the Department of Public Health and Preventive Medicine, University of Pennsylvania School of Medicine in Philadelphia, is offering postgraduate study in the early detection and prevention of disease, May 9-13, 1960. Co-directors of the course are John P. Hubbard, M.D., and Norbert J. Roberts, both members of the medical school faculty. Further information on this and other clinical postgraduate courses from ACP, 4200 Pine Street, Philadelphia 4, Pa. Fee for ACP member, $60; nonmember $80.

What is described as a first-time public relations institute held exclusively for health and welfare agency personnel on a nation-wide basis will be held in New York City June 2 and 3, 1960, by the National Publicity Council for Health and Welfare Services.

Geared to agency administrators as well as to public relations and education staffs and volunteers on the local, state, and national levels, the program will deal with the latest thought and practice in public relations planning and evaluation. Faculty will be drawn from both the nonprofit and commercial public relations fields.

Registration fee is $10 for persons in member agencies of the National Publicity Council, and $15 for others. Advance registration is required. Further information from the National Publicity

Council, 257 Fourth Avenue, New York 10, N. Y.

The Trudeau School of Tuberculosis and Other Pulmonary Diseases will hold its Forty-fifth Session from June 6 to 24, 1960, at Saranac Lake, N. Y.

Approximately half of the session is to be devoted to tuberculosis and the other half divided between such subjects as silicosis, pulmonary fibrosis, emphysema, fungus infection, sarcoidosis, pneumonias, and intrathoracic tumors.

Enrollment is limited and application should be made early. Tuition is $100; a few scholarships are available. Inquiries to the secretary of the school, Box 500, Saranac Lake, N. Y.

A two-weeks Institute on Chronic Disease Control will be held June 13-24, 1960, at the University of Michigan School of Public Health. Co-sponsors with the school are: the Directors of Chronic Disease Teaching Programs of Schools of Public Health, the Association of State and Territorial Chronic Disease Program Directors, the Michigan Department of Health, and the Public Health Service.

The course will include lectures and seminars on: health promotion, prevention, early detection, multiple screening, home care, institutional care, and rehabilitation, in relation to the chronic diseases.

Although attendance is limited and the course is designed for public health physicians in chronic disease control programs, selected public health nurse consultants, nutritionists, and health educators active in such programs are eligible to attend. Deadline for application is May 15, 1960. Information from Director of Continued Education, School of Public Health, University of Michigan, Ann Arbor, Mich.

Anyone working in the Medical Record Department of a hospital, clinic, or other medical facility is eligible to attend one of this year's three Basic Institutes for Medical Record Personnel, co-sponsored by the American Association of Medical Record Librarians and the American Hospital Association. The institutes are scheduled: June 13-17 for Rapid City, S. D.; August 15-19 for Chicago, Ill.; and November 7-11 for Miami Beach, Fla. Each will include lectures and discussion group sessions covering such topics as statistical reports, filing systems, indexing methods, and principles of Standard Nomenclature.

The fee is $50 for members of the AAMRL or the AHA, and $55 for nonmembers. For further information: Chief, Education Program, American Association of Medical Record Librarians, 840 North Lake Shore Drive, Chicago 11, Ill.

The 18th annual session of Yale University's Summer School of Alcohol Studies runs from June 26 to July 22, 1960. Faculty members are drawn from the social sciences, medicine and psychiatry, religion, education, and public health. Seminars for public health workers focus on the epidemiology of alcoholism, tuberculosis and alcoholism, and community mental health services and alcoholism. Workshops are conducted for physicians, case workers, psychologists, clergy, nurses, educators, probation, parole and correctional officers, personnel directors and supervisors in industry, and community leaders. Enrollment is limited to 275 students. Further information from Registrar, Yale Summer School of Alcohol Studies, 52 Hillhouse Ave., Yale Station, New Haven, Conn.

The third hospital administrators development program will be offered by Cornell University's Sloan Institute of Hospital Administration from July 10 to August 5, 1960.

The program, supported by the Alfred

P. Sloan Foundation, is an intensive course of lectures, readings, and discussions designed to provide administrators with new knowledge and perspectives on medical care programs, the administrative process, and trends in hospital administration.

Total cost to the participants selected is $100, covering tuition, supplies, room, and most of the meals. Further information from Sloan Institute of Hospital Administration, Graduate School of Business and Public Administration, Rand Hall, Cornell University, Ithaca, N. Y.

Ohio State University School of Nursing and the Ohio Department of Health are sponsoring a summer workshop from August 15 to 19, 1960, for occupational health nurses, especially those newly employed in industry. Under the guidance of Mary Louise Brown, assistant professor of public health at Yale University, participants will discuss problems faced in the work situation, explore ways of solving them, identify the functions of occupational health nurses, and the essentials of an effective health service. The workshop fee is $25. Application deadline is July 15. Address Workshop Committee, Ohio State University School of Nursing, 410 West 10th Avenue, Columbus 10, Ohio.

PERSONALS

VIRGINIA APGAR, M.D.,† of the National Foundation, has been presented with one of the three 1960 New York Infirmary Elizabeth Blackwell citations for achievement in investigation, teaching, and practice of anesthesiology.

KATHERINE BAIN, M.D.,* deputy chief, Children's Bureau, Washington, D. C., has been presented with one of the three 1960 New York Infirmary Elizabeth Blackwell citations for her contribution in administration in pediatrics and public health.

THE REV. DR. BOLTON BOONE, administrator, Methodist Hospital, Dallas (Tex.), is the new president of the National Association of Methodist Hospitals and Homes, succeeding the REV. DR. VICTOR B. HANN, superintendent, Methodist Home for Children, Mechanicsburg, Pa.

MORRIS A. BRAND, M.D.,* medical director, Sidney Hillman Health Center, New York City, has been appointed director of study for the Committee on Medication Costs, an independent citizens' group in New York City.

ARNOLD W. BROCKMOLE, M.D., M.P.H.,* former director, Butte County (Calif.) Health Department, is now director, Evansville (Ind.) City-County Health Department, succeeding MINOR W. MILLER, M.D., who died in November, 1959.

DOUGLAS H. BROWN, M.D.,† former director, City Health Department, Portland, Me., has resigned to enter private practice. NORMAN M. WINCH, P.E., of the department, is acting director.

IDA L. BRUGNETTI, M.P.H.,† formerly health education consultant, Chronic Disease Branch, PHS, is now health education consultant, Illinois Society for the Prevention of Blindness, Chicago.

DALE C. CAMERON, M.D.,† formerly with the Minnesota Department of Public Welfare, has been recommissioned in the PHS and appointed to Training Branch, National Institutes of Mental Health.

LESLIE A. CHAMBERS, Ph.D.,† director of research, Los Angeles County Air Pollution Control District, will become scientific director, Allan Hancock Foundation for Scientific Research at the University of Southern California, on April 29.

SIDNEY B. CLARK, M.D., M.P.H.,* former assistant director, San Diego (Calif.) Department of Public Health, has become chief of preventive medicine for the United States government in the Panama Canal Zone.

ELROY K. DAY,* former senior sanitary engineer, Division of Sanitary Engineering, Bureau of State Services, PHS, is now facilities planning officer of the bureau.

K. BARBARA DORMIN, R.N.,† formerly coordinator of patient teaching and continuity of patient care, Massachusetts General Hospital (Boston), has been appointed assistant director, Bureau of Public Health Nursing, New York State Health Department.

WINFIELD G. DOYLE, Ed.D.,† since 1951 curator of education and administrative associate

* Fellow.
† Member.

to the director, is now associate director, Cleveland Health Museum, Cleveland, Ohio. Dr. Doyle has also been elected vice-president for Ohio by the Midwestern Museum Conference of the American Association of Museums.

VIVIAN V. DRENCKHAHN, M.P.H.,* formerly adviser in health education, Southeast Asia Region of WHO, New Delhi (India), is now WHO health education consultant, Malaria Eradication Training Center, Kingston, Jamaica, BWI.

ROBERT EMRICK, M.D., has been appointed assistant chief, Bureau of Adult Health, Hawaii State Health Department, replacing FRANK GLASER, M.D., now at the University of California School of Public Health.

LEROY L. FATHERREE, M.D., M.P.H.,* formerly director, Champaign-Urbana (Ill.) District Health Department, became director, Illinois Department of Public Health, on February 1.

JOHN P. FOX, M.D., M.P.H.,* former director, Division of Graduate Public Health and Administration, Tulane University Medical School, is now chief, Division of Epidemiology, Public Health Research Institute of the City of New York, Inc.

BYRON F. FRANCIS, M.D.,† clinical professor of medicine, University of Washington Medical School, has been appointed medical director, Firland Sanatorium, Seattle, Wash.

RALPH D. GUTERMAN, formerly clinical psychologist, Rhode Island Mental Hygiene Clinic (Providence), is now psychologist, Southeastern Regional Mental Health Clinic (Juneau), Alaska Department of Health and Welfare.

VINCENT H. HANDY, M.D., M.P.H.,† assistant director, Bureau of Cancer Control, New York State Health Department, has been awarded a gold medal by the New York State Division of the American Cancer Society, in recognition of his distinguished service in the field of cancer control.

ROBERT D. HENTHORNE, D.V.M., received the 1959 Charles A. Griffin Award at the 10th Annual Meeting of the Animal Care Panel for his work in promoting and developing high standards for the production and use of disease-free animals.

BASCOM JOHNSON, M.D., M.P.H.,* former manager, VA Hospital, Iron Mountain (Mich.), is now director of TB Control, Alaska Department of Health and Welfare, Anchorage.

MORRIS KLAPPER,† former assistant executive director, in charge of program, National Association for Mental Health, is now assistant professor, Department of Physical Education and Rehabilitation, New York Medical College, Flower and Fifth Avenue Hospitals, New York City.

LEON R. LEZER, M.D., M.P.H.,† acting chairman, Department of Preventive Medicine, University of Vermont College of Medicine, is on leave from January 1 to August 31, 1960, with a Commonwealth Fellowship.

DR. JOHN H. LITCHFIELD,† former assistant professor of food engineering, Illinois Institute of Technology, Chicago, Ill., is now with the Biosciences Division, Battelle Memorial Institute, Columbus, Ohio.

HERBERT L. LOMBARD, M.D., M.P.H.,* recently retired director, Division of Cancer and Chronic Diseases, Massachusetts Department of Public Health, was officially honored on January 20 by the Commonwealth of Massachusetts and the medical profession for his many outstanding contributions in the fight against cancer.

ROSS MCCONNELL, M.D., formerly chief of traffic epidemiology, Pennsylvania Department of Health, is now director, Glaucoma Screening Project, the Ophthalmological Foundation and the New York Association for the Blind.

FRANK B. METTING, formerly medical director, Arabian Oil Company, Saudi Arabia, has been named health officer, Allegheny County (Pa.) Health Department's Northwest District.

DWIGHT F. METZLER,* chief engineer, Kansas State Board of Health, is participating in a study of sanitation and water supply problems in villages of India during February, March, and April.

GEORGE V. MOORHEAD, M.P.H., former associate director of health and physical education at Central Y.M.C.A. in Honolulu, has joined the staff of the Hawaii State Health Department as a public health educator.

CHARLES L. NEWBERRY, M.D.,* was erroneously reported in the December, 1959, Journal as being retired. Dr. Newberry is health officer for Washington County, Ore., the position he has held by merit-system appoint-

* Fellow.
† Member.

ment, and not as "PHS officer assigned" for the past four years. The retirement referred to was from the PHS with which his active duty ended in 1954.

GEORGE G. NIMMO, former educational director, Michigan State Board of Alcoholism, is now director, Division on Alcoholism, New Hampshire State Department of Health, succeeding CAMILLE LAMBERT, who resigned to resume special training in sociology.

MARVIN E. PERKINS, M.D., M.P.H.,* formerly chief, Bureau of Mental Health, District of Columbia Department of Public Health, is now director, Community Mental Health Services, New York City Community Mental Health Board.

ROBERT PINTHER, former sanitary engineer, Division of Indian Health, Billings, Mont., is now public health engineer, Division of Environmental Sanitation, Wyoming Department of Public Health.

HOMER F. RAY, JR., M.D., formerly acting superintendent, Somerset State Hospital (Pa.), is now psychiatrist, Southeastern Regional Mental Health Clinic (Juneau), Alaska Department of Health and Welfare.

R. F. SONDAG, M.D., M.P.H.,* former regional health officer, is now assistant director, Illinois Department of Public Health, Springfield.

ESTELLA FORD WARNER, M.D.,* retired, has been presented with one of the three 1960 New York Infirmary Elizabeth Blackwell citations for achievement in public health and preventive medicine.

JAMES M. A. WEISS, M.D., M.P.H.,* formerly director of training, Malcolm Bliss Mental Health Center and assistant professor of psychiatry, Washington University School of Medicine, St. Louis, Mo., is now associate professor of psychiatry, University of Missouri School of Medicine.

ROBERT S. WILSON, Ph.D., former clinical psychologist with the Oklahoma City (Okla.) Community Clinic, is now resident psychological services administrator of Maui, Hawaii State Health Department.

DEATHS

W. W. BROWNE, Ph.D.,* professor of bacteriology, College of the City of New York, about a year ago (Laboratory Section).

CARL R. FELLERS, Ph.D.,* food technologist, former government bacteriologist and retired head of the Department of Food Technology, University of Massachusetts, on February 22 at the age of 66 (Food and Nutrition Section).

MARY S. GARDNER,* of Providence, R. I. (Public Health Nursing Section).

WILLIAM H. HAY,† chief of laboratories, Cleveland (Ohio) Division of Health, on January 29 (Laboratory Section).

CLARA JACOBSON, M.D.,† physician in charge, Grand Crossing Clinic, Municipal Tuberculosis Sanitarium, Chicago, Ill. (Unaffiliated).

JANET WELCH MACKIE, M.D.,† assistant chief, MCH Services, Division of Indian Health, Public Health Service, Washington, D. C., on November 24, 1959 (Unaffiliated).

CASSANDRA RITTER,* bacteriologist, Water and Sewage Laboratory, Kansas State Board of Health, Topeka, on February 16 (Laboratory Section).

JOHN C. SEASE, M.D.,† health officer of Newberry, Laurens, and Union Counties, South Carolina, on January 31 (Health Officers Section).

BJORN SIGURDSSON, M.D.,† director, Institute for Experimental Pathology, University of Iceland, Reykjavik (Laboratory Section).

COLONEL J. F. SILER,† president, Gorgas Memorial Institute of Tropical and Preventive Medicine, Washington, D. C., on February 7, at the age of 84 (Laboratory Section).

VINCENT M. SMALL, M.D.,† county health officer, Sumner County Health Department, Gallatin, Tenn., on January 25 (Health Officers Section).

HORACE C. SWAN, M.D.,* formerly professor of physiology and hygiene, medical director emeritus, Trinity College, Hartford, Conn., on March 1, 1959 (Unaffiliated).

CONFERENCES AND DATES

American Public Health Association, Eighty-Eighth Annual Meeting, San Francisco, Calif. October 31–November 4.

Eighty-Ninth Annual Meeting, Detroit, Mich. November 13–17, 1961.

State and Regional Public Health Meetings—April, May, and June:

Arizona Public Health Association. Arizona Ambassador Hotel, Phoenix. April 20–22.

Arkansas Public Health Association. Hotel Marian, Little Rock. May 10–11.

* Fellow.
† Member.

Colorado Public Health Association with Western Branch, APHA. Shirley-Savoy Hotel, Denver. May 25–28.

Georgia Public Health Association. De-Soto Hotel, Savannah. May 16–18.

Idaho Public Health Association. Bannock Hotel, Pocatello. April 29–30.

Illinois Public Health Association. St. Nicholas Hotel, Springfield. April 21–22.

Indiana Public Health Association with Middle States Public Health Association. Hotel Severin, Indianapolis. April 27–29.

Iowa Public Health Association. Fort Des Moines Hotel, Des Moines. April 11–12.

Kansas Public Health Association. Broadview Hotel, Wichita. April 18–20.

Kentucky Public Health Association. Sheraton Hotel, Louisville. April 5–7.

Louisiana Public Health Association. Jung Hotel, New Orleans. May 18–20.

Michigan Public Health Association. Pick-Fort Shelby Hotel, Detroit. May 12.

Middle States Public Health Association with Indiana Public Health Association. Hotel Severin, Indianapolis, Ind. April 27–29.

Missouri Public Health Association. Hotel Governor, Jefferson City. May 9–11.

Montana Public Health Association. Eastern Montana College of Education, Billings. April 13–14.

New Mexico Public Health Association. La Fonda Hotel, Santa Fe. April 20–22.

New York State Public Health Association. Hotel New Yorker. New York City. May 23–27.

North Dakota Public Health Association. Hotel Gardner, Fargo. May 16–17.

Ohio Public Health Association. Neil House, Columbus. May 26–27.

South Carolina Public Health Association. Ocean Forest Hotel, Myrtle Beach. May 12–14.

Southern Branch, APHA. Peabody Hotel, Memphis, Tenn. April 13–15.

United States-Mexico Border Public Health Association. Hermosillo, Sonora. April 4–8.

Utah Public Health Association. Union Bldg., University of Utah, Salt Lake City. April 25–26.

Virginia Public Health Association. Hotel Roanoke, Roanoke. May 16.

West Virginia Public Health Association. West Virginia Hotel, Bluefield. May 12–13.

Western Branch, APHA with Colorado Public Health Association. Shirley-Savoy Hotel, Denver, Colo. May 24–26.

Wisconsin Public Health Association. Wisconsin Center, University of Wisconsin. Madison. June 14–15.

Meetings of Other Organizations:

American Academy of Pediatrics. Atlantic City, N. J. April 20–22.

American Association of Industrial Nurses—Industrial Health Conference. Rochester, N. Y. April 26–28.

American College of Nurse-Midwifery. Sheraton-Park Hotel, Washington, D. C. May 6–7.

American Diabetes Association. Deauville Hotel, Miami Beach, Fla. June 11–12.

American Hearing Society. Statler Hotel, Detroit, Mich. May 24–27.

American Home Economics Association. Denver, Colo. June 28–July 1.

American Medical Association. Americana Hotel, Miami Beach, Fla. June 13–17.

American National Red Cross. Kansas City Auditorium. Kansas City, Mo. May 16–18.

American Nurses' Association. Biennial. Miami Beach, Fla. May 2–6.

American Physical Therapy Association. Penn-Sheraton Hotel, Pittsburgh, Pa. June 26–July 1.

American Psychiatric Association. Traymore Hotel and Convention Hall, Atlantic City, N. J. May 9–13.

American Social Hygiene Association. New York, N. Y. May 9.

American Society of Medical Technologists. Ambassador Hotel, Atlantic City, N. J. June 19–24.

American Water Works Association. Bal Harbour, Fla. May 15–20.

Child Study Association. New York, N. Y. May 21.

Conference for Health Council Work. Atlantic City, N. J. June 4–5.

International Symposium of the Deborah Hospital on Current Concepts in Medicine. Bellevue-Stratford Hotel, Philadelphia, Pa. April 28–30.

International War-Prophylaxis Congress for Physicians. Grand-Hotel Huis ter Duin at Noordwijk on Sea, Holland. May 23–28.

Japanese Association for Infectious Diseases. The Komagome Hospital, Tokyo, Japan. April 4–6.

National Conference on Social Welfare. Atlantic City, N. J. June 5–10.

National Publicity Council for Health and Welfare Services—Institute on Health and Welfare Public Relations. New York, N. Y. June 2–3.

National Social Welfare Assembly. New York, N. Y. April 25.

National Tuberculosis Association. Statler and Biltmore Hotels. Los Angeles, Calif. May 15–20.

Nuclear Congress. The Coliseum, New York, N. Y. April 3–8.

Pan American Medical Association Congress. Mexico City, Mexico. May 2–11.

Pan American Medical Women's Alliance. San Juan, Puerto Rico. June 3–8.

Royal Society of Health Congress. Torquay, Devon, England. April 25–29.

Third International Congress on Medical Records. Edinburgh, Scotland. April 24–30.

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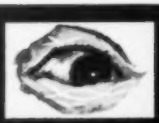

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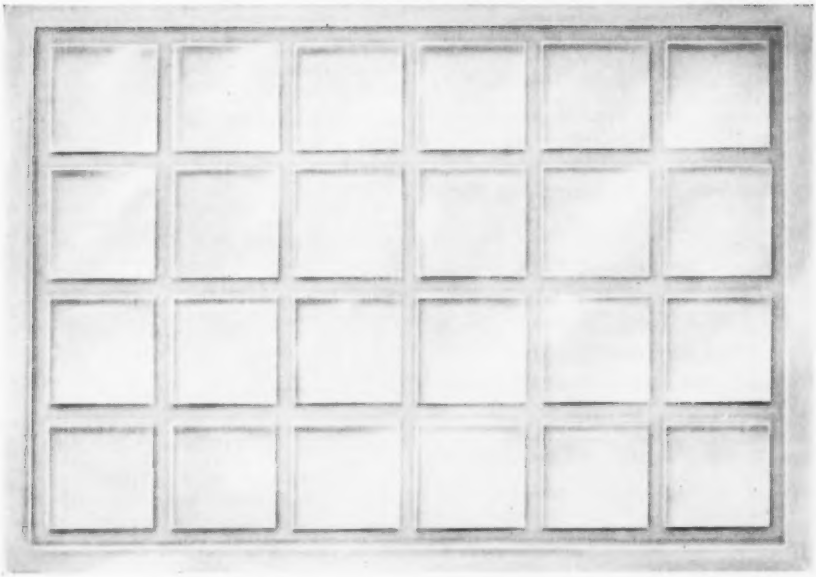

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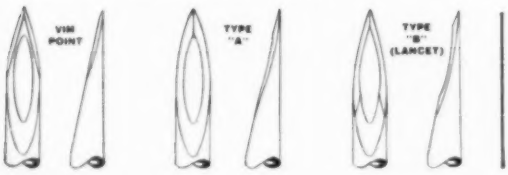

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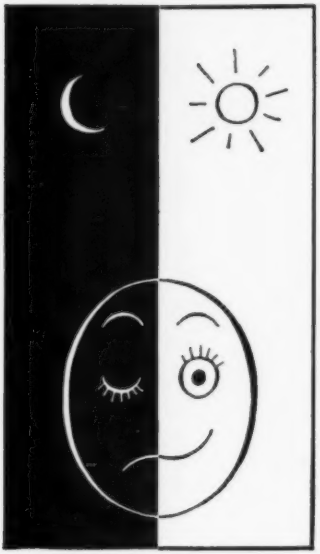

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breaking
the long night fast
with nutritious

MEAT for breakfast?

Meat is a logical nutritious "build-up". Far too many people, both adults and children, need to be reminded professionally that a nourishing breakfast is essential to help maintain good health.

Meat adds *Zest* to breakfast

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A moderate low-fat well-balanced breakfast for a woman of 45

Overweight not only detracts from personal appearance, it steals from a person's chance for a long and healthy life. As a service to those advising about weight control, a moderate low-fat, well-balanced breakfast is presented here for your consideration. *Its fat content of 10.9 gm. provides 20 per cent of the total calories which makes it a moderate low-fat morning meal.* For women in this age group and for most others, it provides about one-fourth of the recommended dietary allowances as shown in the chart below. This basic cereal and milk breakfast is *well-balanced and nutritionally efficient* as demonstrated by the Iowa Breakfast Studies.

Recommended Daily Dietary Allowances and the Nutritional Contribution of a Basic Cereal and Milk Moderate Low-Fat Breakfast*

Menu: Orange Juice—4 oz.;
Cereal, dry weight—1 oz.;
Whole Milk—4 oz.; Sugar—1 teaspoon;
Toast (white, enriched)—2 slices;
Butter—5 gm. (about 1 teaspoon);
Nonfat Milk—8 oz.

Nutrients	Calories	Protein	Calcium	Iron	Vitamin A	Thiamine	Riboflavin	Niacin equiv.	Ascorbic Acid
Totals supplied by Basic Breakfast	503	20.9 gm.	0.532 gm.	2.7 mg.	588 I.U.	0.46 mg.	0.80 mg.	7.36 mg.	65.5 mg.
Recommended Dietary Allowances—Women, 45 Years (58 kg.—128 lb.)	2200	58 gm.	0.8 gm.	12 mg.	5000 I.U.	1.1 mg.	1.5 mg.	17 mg.	70 mg.
Percentage Contributed by Basic Breakfast	22.9%	36.0%	66.5%	22.5%	11.8%	41.8%	53.3%	43.3%	93.6%

Cereal Institute, Inc.: Breakfast Source Book. Chicago: Cereal Institute, Inc., 1959.
Food & Nutrition Bd.: Recommended Dietary Allowances, Revised 1958. Natl. Acad. Sci.—Natl. Research Council Publication 589, 1958.
Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

**The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. Calorie allowances apply to individuals usually engaged in moderate physical activity. For office workers or others in sedentary occupations they are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.*

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. . . some of the new pipets we've added during the past year or so

You can be pickier than ever about the pipets you use for biological work; we've added to and refined the entire line of PYREX pipets.

New tips. There's a bigger hole in the tip of No. 7087 that lets you work faster with viscous liquids such as heavy creams, curds, and oils. Thanks to an extra-long, narrower tip on No. 7084, you can work more easily with Warburgs, small flasks and tubes, and the like. Tips on No. 7105 pipets, designed especially for Folin tests of urine and blood sera, are now uniform in length and diameter.

Like all PYREX tips these are stoned to a smooth bevel which reduces snagging and breakage significantly.

New tops. No. 7086 is an ACCU-RED pipet with a cotton plug top for safe transfer of a virus or pathogen; for the first time you can combine the strength and long-lasting marks of ACCU-RED with cotton plugs.

No. 7096 is a rinse-out pipet for accurate micro dilutions.

All our tops are flat and smooth for precise finger control. They're also fire polished for easy removal of lipstick and other stains.

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BETA CAROTENE

IN THE SPOTLIGHT

Colors call to your appetite. Some foods are naturally attractive in color. Some must be made so. For example, butter and margarine must be a good yellow for widest appeal.

Making foods look better, making them taste better, making them nutritionally more valuable are practices everyone accepts and expects. Food processors now add pure, safe beta Carotene Roche to give natural yellow color, plus vitamin A value.

Beta carotene is a *safe* color. Beta carotene is one of nature's own coloring agents. It has been consumed in foods for thousands of years. Beta carotene is officially accepted as a food coloring in the U.S.A., Great Britain, Switzerland, and many other countries. Health, too, is served by beta carotene. Being a provitamin, it contributes vitamin A value. *Beta Carotene is the color that nourishes.*

Look for the words: "Colored With Beta Carotene" on the labels of foods you buy, such as margarine, shortening, lard, butter, cheese, salad and cooking oils, confections, yellow baked goods, beverages, and ice cream products. You can be sure that the food processors who use beta carotene have your good health in mind.

More information about beta carotene, in an interesting brochure, is yours for the asking. Just write to the Department of Education at the address below.

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The Leitz Labolux IIIa is a new laboratory microscope with built-in illumination and the famous Labolux ball-bearing focusing control, which combines both coarse and fine focusing in a single knob. Available with a wide variety of accessories, the Labolux IIIa is recommended for all routine laboratory work and, in addition, can be equipped to fulfill the most exacting research.

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To maintain day-in, day-out reduction in bacterial contamination of all areas—use of Tergisyl® disinfectant-detergent on all floors and walls, frequently and repeatedly, not only decontaminates immediately but has demonstrable residual effect.*

The proven effectiveness of our phenolic disinfectants recommends any one of them for your consideration. Amphyl®, O-syl® and Lysol® disinfectants, and Tergisyl® disinfectant-detergent have individual characteristics to aid in selection but all are effective against Staph as well as many other pathogenic organisms, including TB bacilli.

*
Please write
for report and
product samples

C. F. Manz

Charles F. Manz
General Sales Manager
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Tassette®

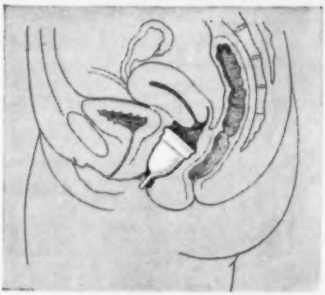
the safe and sanitary menstrual cup

You can prescribe Tassette with full assurance that your patient will find a safe, effective and completely acceptable answer to her menstrual control problem. *Tassette*, made of soft pliable rubber fits anatomically at the mid point of the vaginal wall and acts as a catch basin for the menstrual flow (see anatomical drawing). It is easily folded, needs no inserter, and can be simply emptied and replaced as needed. Tassette requires no measurements or fitting, and can be worn with complete comfort at all times.

Tassette permits your patient to swim, dance and engage in any activity because it catches the flow and seals it off completely. Thus there is no odor or possibility of leakage or staining as may occur during periods of heavy flow when tampons are used. There is no danger of chafing, irritation or infection, and no belt is required, as with ordinary sanitary napkins.

Tassette has many medical applications other than its use as a menstrual cup. During the intermenstrual period it provides the most satisfactory and safe method for collecting vaginal, cervical or uterine secretions for diagnostic purposes. Tassette has also been used to insure against leakages in vesico-vaginal fistula.

Modern internal menstrual control is now accepted by the medical profession and Tassette is widely recommended by gynecologists in place of sanitary napkins and tampons. In order to acquaint you with Tassette this special offer is made: Send $3.50 (reg. price $4.95) for one Tassette with complete directions, postage prepaid. Tassette guarantees satisfactory use for two years or your money back.



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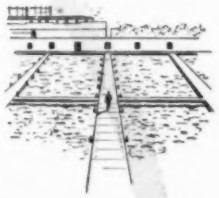

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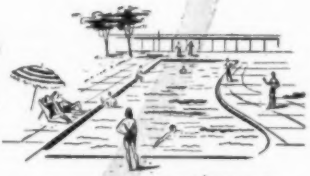

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References: 1. Dowling, H. F.: Postgrad. Med. *23*:594 (June) 1958. 2. Gimble, A. I.: Shea, J. G., and Katz, S.: Antibiotics Annual 1955-1956 New York, Medical Encyclopedia Inc., 1956, p. 676. 3. Long, P. H., in Kneeland, Y., Jr., and Wortis, S. B.: Bull. New York Acad. Med. *33*:552 (Aug.) 1957. 4. Rein, C. R.: Lewis, L. A., and Dick, L. A.: Antibiotic Med. & Clin. Ther. *4*:771 (Dec.) 1957. 5. Stone, M. L., and Meruheimer, W. L.: Antibiotics Annual 1955-1956, New York, Medical Encyclopedia Inc., 1956, p. 862. 6. Campbell, E. A.: Prigot, A., and Dorsey, G. M.: Antibiotic Med. & Clin. Ther. *4*:817 (Dec.) 1957. 7. Chamberlain, C.; Burros, H. M., and Borromeo, V.: Antibiotic Med. & Clin. Ther. *5*:521 (Aug.) 1958. 8. From, P., and Alli, J. H.: Antibiotic Med. & Clin. Ther. *5*:639 (Nov.) 1958.

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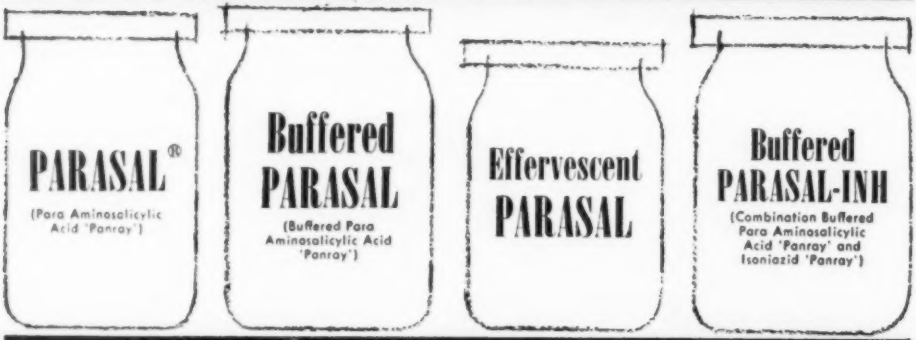

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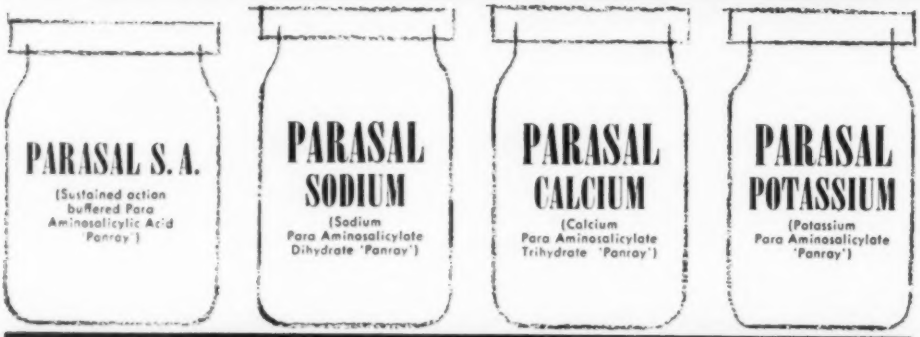

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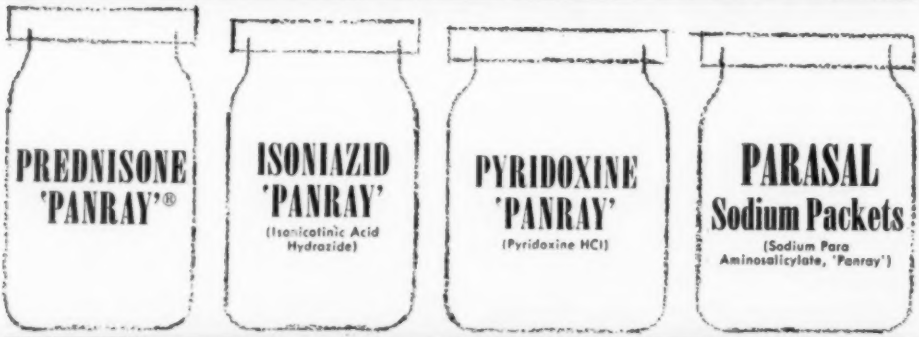

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Enriched, whole grain or restored breads and cereals, other baked foods made with enriched or whole grain flour, enriched macaroni, spaghetti and noodles	Children . . . . . 3 to 4 cups Teen-agers . . . . 4 or more cups Adults . . . . . 2 or more cups Cheese and ice cream may replace part of the milk	Include a citrus fruit or tomato, a dark-green or yellow vegetable, and other vegetables and fruits, including potatoes	Beef, veal, pork, lamb, fish, poultry, eggs . . . with dry beans, dry peas, nuts and peanut butter as alternates and for variety	

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